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AMERICAN ANALYST.

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January to December, 1890.

Nothing to Do.—How can a man say that a woman has nothing to do? In one year she gets dinner 365 times, washes the dishes 1,095 times, gets the children ready for school twice a day for 180 days, gets the baby to sleep 1,400 times, makes about three hundred calls, and, as she wishes for something she hasn't every minute, she wishes sixty things an hour, or 262,800 things in a year. Who says that a woman has nothing to do? —*Ex.*

Plants in the Sleeping Room.—The prejudice prevails that plants in the sleeping room are injurious because they are constantly throwing off carbonic acid. Recent investigations have shown that ill effects are altogether too slight to deserve consideration. If a room is properly ventilated, plants can do no harm, and even if it is not, the quantity of carbonic acid exhaled by them will not materially affect the purity of the air.

Case Hardening.—Professor Elihu Thomson has recently devised a method of case hardening iron or steel by means of the heat produced by the passage of an electric current. His process consists essentially in heating the object electrically, and then applying to the metal so heated a surrounding envelope—either gaseous, fluid, or solid—for the purpose of changing or preventing change in the quality of the material, according to the special end to be attained.

Air Power.—Systems for distributing power in cities from a central station are coming more into use every day. Steam, electricity and compressed air are the common agents, but Paris has a system which is the reverse of that employing compressed air. The motors operate by a vacuum created by immense air pumps at the central station. The cost per horse per hour is 23 cents, about the same as with the ordinary gas engine when illuminating gas is used.

Warmth and Digestion.—I would note one fact in reference to food, namely, that warm food of all kinds is more digestible than cold. I have been told by patients many a time that they cannot understand why they suffered so much from indigestion at bed-time, for they had only taken a little cold beef and cold rice pudding for supper. The fibres of a bit of cold beef are compact, and the cold milk of a rice pudding to many persons is as solid and indigestible as cheese.—*Dr. E. B. Shuldham.*

Scale Expensive.—It is estimated that the presence of 1-16 inch of scale causes a loss of 13 per cent. of fuel; ½ inch of scale causes a loss of 38 per cent. of fuel; ¼ inch of scale causes a loss of 60 per cent. of fuel. The amount expended in consequence of loss of fuel and extra repairs on a locomotive in the Middle and Western States has been carefully estimated at about $750 per annum, and for the same power in stationary boilers at about a similar amount. All this extra expenditure is due to incrustation.

Fire-proof.—Investigations of fire ruins show that porous terra-cotta bricks and blocks best resist fire, water and frost; next to these in the order of fire-resisting qualities are the various concretes, or some of them, and burned clay work. In the best building work now done the iron part is encased in porous terra-cotta, tile or brick work in roof, floor and tile construction; the hollow tiles are faced with vitreous tile, slate or any good weather-proof coating, or with a single thickness of brick. Incased in fire-proof materials, iron and steel work is claimed to give the best results.

Imperfect Nature.—"It requires at least two models, as a rule, to produce one good figure for a picture of the nude," said an artist lately. He was standing before the painting of a young girl, and he criticized it because the arms were entirely too thin to compare well with the bust and hips. "That is undoubtedly a true copy of the model from which it was painted," said the artist, "but the painter should have brought in another model with good arms. The perfect arm is so difficult to find that one woman in this city gets a good living simply by exposing her arms in the studios of the figure painters."

Cremation.—The practice of cremation in place of ordinary burial is making steady progress in Paris, in spite of the opposition to it which exists in certain quarters. At the new crematorium of the cemetery "Pere-la-chaise" a furnace is in operation which will reduce a body to ashes in less than an hour, at a cost of about thirty cents for fuel. Since the establishment of this system in the French capital twelve hundred unclaimed bodies of persons who have died in hospitals have been thus disposed of, besides the bodies of three hundred of the well-to-do classes, whose wishes have been thus complied with.—*Popular Science Monthly.*

Sharp Practice.—The celebrated surgeon, Professor Billroth, of Vienna, was asked to perform an operation upon a Russian Jew, and he agreed to do it for a fee of two hundred and fifty guineas. On making the journey to the small town in which his patient lived, he was informed that the Jew had suddenly died. However, in order that he should not suffer loss by the transaction, the professor was asked whether he would treat five hospital patients for a fee of fifty guineas each. He accepted the offer and did the work, and just as he was starting homeward he ascertained that one of the five patients upon whom he had operated was the Jew who was reported to have died.

Solomon in all his Glory.—We have recently read a most humorous description of a donation party given to a good country clergyman, in part payment of his small salary, the principal result being twenty-seven bushels of beans and a large quantity of second-hand clothing for his five children. The patience of the clergyman's wife gave out. On the next Sunday she dressed all her five children in the donated second-hand clothing, and under her direction they marched up the aisle just as the good pastor was reading that beautiful passage, "Yet Solomon, in all his glory, was not arrayed like one of these." We need not add that the next donation party was of an entirely different character.

African Explorers.—A list of explorers who have crossed Africa shows that from 1802 to 1811 the feat was accomplished by a Portuguese, Honorato de Costa; in 1838 and 1853 by Francesco Coimbra and Silva Porto; in 1854 by Dr. Livingstone; in 1865 by Gerhard Rohlfs; in 1874 by Lieut. Cameron and Mr. Stanley; then by Serpa Pinto and the Italians Mattenia and Massari; next by Lieut. Wissmann, from 1882 to 1884; and recently by the Scotch missionary Arnat, the Portuguese Capello and Ivans, the Swedish Lieut. Gleerup who occupied the least time, crossing from Stanley Falls to Bagamoyo in six months; the Austrian Dr. Senz; Mr. Stanley for the second time; and, finally, Capt. Trivier, the French traveler. The first explorer who crossed Africa took nearly ten years, while the last occupied barely a year.

Complexion Frauds.—The Massachusetts Board of Health has investigated the matter of selling a certain class of poisons without being properly so labeled. The result of this investigation is bearing fruit. The board discovered that "Madam Ruppert's Face Bleach" and "Madam Yale's Complexion Bleach" were solutions of corrosive sublimate, and were sold without being labeled as poisons. In consequence of this, the agents of these cosmetics have been legally proceeded against for selling poisons contrary to law. There are many just such nostrums sold everywhere and every day, in open violation of both the spirit and letter of the law governing the sale of poisons, and it is time that some action was taken to stop this dangerous practice. All must grow old; wrinkles will come, and the "sear and yellow" complexion; and all the humbugs on earth cannot alter nature's laws, or fix the charms of youth on the face of old age.—*Sanitary News.*

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CONTENTS.

A SNEEZING EPIDEMIC.

An epidemic of influenza broke out in eastern Europe about the middle of December, and as the published indications showed that it had a tendency to progress westward considerable apprehension was felt lest it should make its appearance on this side also of the Atlantic. As its advance would probably be sudden, the physicians held out the consoling prospect that the first intimation we should have of its arrival would be its general seizure of the community. Possibly by the time this writing gets into print the "Grippe," as it has been felicitously named in Europe, will have its grasp upon us. The malady seems to be a kind of contagious influenza, accompanied by violent and protracted sneezing. A similar epidemic prevailed here in 1848. A Paris letter of the 21st of last December, describing the extent of its ravages down to that date in Europe says, that the medical world had endeavored to account for it on the hypothesis that the phenomenally mild weather has been favorable to the breeding and nourishment of certain germs which long ere this time of year should have been annihilated by frost. But this explanation is not altogether convincing, seeing that the disease has no geographical limitation, having thrived lustily alike in the frozen north and the balmy south. Its symptoms also vary to a considerable extent, apparently in sympathy with climatic conditions and individual peculiarities. In Great Britain there is a marked cerebral disturbance, nausea or vomiting, violent diarrhœa, sore throat with extreme muscular weakness, cardiac pain and depression and severe aching of the limbs and muscles of the back. In Spain these symptoms are varied by chills, shivers, bone-aches, headache and fever. The remedies recommended or enforced are as varied and curious as the symptoms. In Paris men painted their moustaches with a preparation of pinol and tried bravely to give up smoking. Many families tried keeping indoors with doors and windows sealed, but the result was not encouraging. At the opening of Christmas week there were not less than half a million people suffering from this disease in Europe. In Odessa there were said to be about 40,000 victims; in Antwerp 10,000 cases; in Paris 60,000 to 80,000; in Madrid 30,000, and so on. The disease seriously affected business also, for those who could afford it were rushing south or migrating into the country.

TRADE MARK LAW.

The word "trademark" is not, as many people erroneously suppose, confined to a registered trademark but includes that sense of the word. Trademark has been defined by the U. S. Supreme Court to be just what Webster's Dictionary defines it, "a distinguishing mark or device used by a manufacturer on his goods or labels, the legal right in which, is recognized by law." The act of Congress of March 3, 1881, provides for registering trademarks of aliens as well as citizens by causing to be recorded in the Patent office a statement specifying name, domicile, location and citizenship of the party applying; the class of merchandise and the particular description of goods comprised in such class to which the particular trademark has been appropriated; a description of the trademark itself with facsimiles thereof, and statement of the mode in which the same is applied and affixed to goods, and the length of time during which the trademark has been used. This application must be accompanied by proof of its veracity and the rights claimed. The certificate when issued remains in force for thirty years and can be renewed. The government fee is twenty-five dollars. The manufacture, sale, offering for sale or dealing in any goods substantially of the same descriptive properties as those referred to in the registration of any trademark or the affixing of a fraudulent trademark is punishable by a fine not exceeding one thousand dollars or imprisonment not exceeding two years, or both. The same fine is imposed on those who fraudulently refill trademarked packages. It will be noticed that this registering of a trademark only adds to the protection of manufacturers by making the violation of the trademark a criminal act, and as every one knows that aside from the difficulty of obtaining positive and clear proof of criminal intent, it is next to impossible to overcome an average jury's scruples about convicting a poor man at the solicitation of a corporation or rich manufacturer this feature is not worth much. The common law and equity as interpreted by the United States Courts and executed by injunctions and heavy damages gives full and ample protection even in cases where a trademark could not be registered, the only evidence required being that the defendant attempts to sell his make of goods under the guise of the plaintiffs and thus perpetrates a fraud upon the purchaser. To those who sell their goods in bottles this trademark law is a protection by giving them a criminal remedy against those who with fraudulent intent buy up second-hand bottles to refill and sell them as the genuine article. Unfortunately much of the protection thus offered to manufacturers has been carelessly, almost disdainfully, rejected by a failure to prosecute such offenders and defend the manufacturers' rights.

MEDICAL OPINIONS.

ABOUT AMMONIA IN BAKING POWDERS.

A valuable article on this subject has been contributed by Winslow Anderson M. D., of the University of California, to the *Pacific Medical Journal*. The article is entitled "Adulterations in Food."

The housewife, supposing she has pure flour, unhesitatingly and unwittingly adds some of the worst impurities and adulterants possible under the guise and high sounding names of this or that brand of baking powder. Some of the most deleterious substances found in several of our prominent brands of baking powders are,—ammonia, (Hilgard, Johnston), alum, frequently combined with ammonia as ammonia-alum, $Al_2 (NH_4)_2 (SO_4)$, terra alba, China clay, Cornish clay, plaster of paris, bone ash, bone dust, white clay, turmeric, borax, magnesia, sulphate of copper, chrome yellow, common chalk or marble dust and white vitrol! Out of several brands of baking powders which I have analysed during the present year (1889), some of them were found to contain the following deleterious adulterants, viz.: Ammonium carbonate, plaster paris, white mineral, terra alba, sulphate of lime, chalk, marble, dust and alum. These substances are all foreign to the human economy and can serve no purpose as food; on the contrary, they are injurious adulterants and will sooner or later derange the entire digestive system, interfere with the gastric and alimentary secretions, and lay the foundation for chronic gastro-intestinal disorders. It is unqualifiedly our opinion that flours, breads or baking powders containing any of these adulterants should be condemned and their sale prohibited by law as well in the United States as it is in the European States.

EFFECTS OF AMMONIA ON THE HUMAN ECONOMY.

Ammonium carbonate $(NH_4)_2 CO_3$ is a volatile alkali, a product of organic decomposition, formed both within

the body and from without. Within the body it is produced by retrograde tissue metamorphosis in the blood, liver and kidneys. When ammonia and its congener, urea, are not excreted, but remain in the system as is the case in uremia and Bright's disease, the consequences are most serious—oftentimes ending in convulsions and death from the poisonous effects on the nerve centers and the degeneration of the blood-corpuscles. This excrementitious urea ($CH_4\ N_2O$) is interchangeable in the body with ammonium carbonate, as follows:

$$CH_4\ N_2O,\ \text{urea} + \text{water} = \text{ammonium carbonate}\ (NH_4)_2CO_3$$

$$CO \begin{cases} NH_2 \\ NH_2 \end{cases} + 2H_2O = CO \begin{cases} O.NH_4 \\ O.NH_4 \end{cases}$$

(Wood, Hoffman and Ultzman, Boyle.)

Ammonium carbonate taken into the system is converted into urea (Neubauer and Vogel), and may in turn be reconverted into ammonium carbonate. Ammonia is obtained from without the body by the destructive distillation of bones (bone spirits), horns (spirits of hartshorn) and hoofs; from decomposing animal matter and from the ammoniacal liquors of gas works. The daily consumption of ammonium carbonate in any article of food is, in my judgment, as unnatural as it is unsafe. When introduced into the baking powders and dough, for instance, it renders the biscuits alkaline, as only from 10 to 20 per cent. of the ammonia escapes, especially in a hasty baking (Prof. Hilgard). Ammonia used in baking can invariably be detected in the bread for several days. It has a tendency to impair digestion and develop disease. Owing to its great diffusibility, ammonia is rapidly absorbed into the circulation, where it may degenerate and disorganize the blood (Bartholow, U. S. Disp., 1880). The action of ammonium carbonate as a daily diet is deleterious to the mucous membranes of the mouth, throat, stomach and intestinal tract. It irritates the liver, kidneys and nervous system (Wood, U. S. Disp.). The salivary action on starches in the mouth, so essential to their proper digestion and assimilation, is retarded on account of the presence of the ammonia alkali (Hilgard). Ammonia and the other adulterants used in baking are very injurious in cases of weak stomachs. The ammonia used continuously would itself be competent to set up irritation and ulcerations of the mucous membrane (Prof. W. F. McNutt). The daily introduction of ammonia into the stomach produces more or less irritation on the mucous membrane and interferes with digestion by neutralizing the gastric secretions, and dyspepsia is almost sure to supervene (Bartholow, Wood, Hilgard). In this form of our "great American disease," the feeling is as though one had a large bolus or lump in his throat which he is continually, yet ineffectually, trying to swallow. Gastric uneasiness may remain for several hours after each meal, and there will be loss of appetite, nervousness, loss of vitality, emaciation, etc., etc. Ammonia also produces an over-stimulation of the heart, lungs, liver or kidneys. The continued use of ammonia should be carefully avoided in all cases of irritation of the kidneys, and especially so in Bright's disease (Prof. W. F. McNutt). Ammonia is a powerful medicament which should never be introduced into the human stomach excepting by a qualified physician in his legitimate sphere. It is not a food but an excrementitious waste product, having a tendency to act deleteriously on the human economy, and for these reasons, its use in *any* article of diet should be discountenanced and prohibited.

ELECTRICITY AND LIGHT.

EXPERIMENTAL PROOFS OF THEIR IDENTITY.

[*Paper read by Professor H. Hertz, at the Medical Congress in Heidelberg, September*, 1889.]

In speaking of the relations between light and electricity, it might be thought at first that this was a question referring to electric light. But this is not the object of the present paper. If the reader is a physicist, he might think of the reciprocal and very delicate actions of the two forces, such as the rotation of the plane of polarization by the current, or the variation of resistance of a conductor under the influence of light. In all these cases the action is not direct or immediate: between the two forces there is an intermediary, ponderable matter. These phenomena do not in this instance occupy our attention. Other relations exist between these two forces closer and more intimate than those we have mentioned. The proposition which will be enlarged upon in this paper is the following: Light is an electric phenomenon in its very essence; the light of the sun as well as that of a candle or a glow-worm. Suppress electricity in the universe, and light disappears; suppress the luminiferous ether, and electric and magnetic forces no longer exert any influence through space. Such is the thesis which will be supported. It does not date from yesterday or from to-day; its history is long and instructive. My own experiments only mark one of the stages of development of this theory, and it is this development altogether—not one of its phases only—that I would bring before you. But it is not easy on such a subject to be clear without omitting anything essential. The phenomena in question occur in the empty space in the very midst of the ether. They are sensible neither to touch, nor to smell, nor to sight; they are accessible to our thoughts and our reasoning, but it is difficult to describe them accurately. We will, therefore, endeavor to connect them with certain known facts, and, for this purpose, will recall what we know concerning light and heat before attempting to establish a relation between these two forces. What is light? Since the researches of Young and Fresnel we know that it is an undulatory movement. We know the speed of the waves—their lengths; we know that they are transverse waves; in one word, we are acquainted with all the geometrical conditions of the movement. All these facts are absolutely incontestable and removed beyond all doubt. The theory of undulation is, humanly speaking, certain, and all that follows from it is likewise certain. It is, therefore, certain that all space which is accessable to us is not empty, but filled with a substance capable of entering into vibration—ether. But if we possess very clear notions on the geometrical condition of the phenomena which occur in this medium, their physical nature, on the other hand, is very obscure, and what we know of the properties of the substance itself is full of contradictions. Comparing luminous waves with sonorous ones, they had been considered as elastic. But, in fluids, elastic waves only occur in the form of longitudinal waves. Transverse elastic waves are impossible in fluids; the very nature of matter is opposed to them. The admission that the ether behaved like a solid body was, therefore, compulsory. On the other hand, on recalling the movement of the heavenly bodies, we are compelled to affirm that the ether acted like a perfect fluid. The rapid development of optics is altogether an astonishing fact in view of the flat contradiction offered by these two propositions. Without trying to hide this difficulty, let us pass on to electricity; maybe its study will enable us to circumvent this obstacle. What is the nature of electricity? This is a very arduous problem and one which excites interest far beyond the limited reach of the scientists. Most of those who ask themselves this question, do not doubt the existence of electricity; they expect a description, an enumeration of the properties and qualities of this singular substance. For the scientist the problem assumes another form: Does electricity really exist? Are not electrical phenomena, like others, traceable to the properties of the ether and of ponderable matter? The state of our knowledge does not enable us as yet to answer this question in the affirmative. Materialized electricity still plays an important part in our conceptions, and there is still preserved in current language the ancient and familiar idea of two electricities which attract or repel each other, and to which we attribute actions at a distance which resemble intellectual qualities. The time when this theory was formulated was the moment when Newton's law of gravitation received such a striking confirmation in astronomy, and the idea of an action at a distance without any intervening medium was familiar to the mind. Electric and magnetic attractions obeyed the same laws as gravitation; therefore, in admitting a similar action at a distance, the phenomenon seemed to have been explained in the simplest and most satisfactory fashion. All this was altered when, in the present century, the reciprocal action of currents and of magnets was discovered, an action variable *ad infinitum*, and in which motion and time play such an important part. The number of actions at a distance had to be enlarged, their theory had to be perfected. But at the same time disappeared the simplicity of the system which gave it its scientific probability. An attempt was made to return to this simplicity by seeking simple formulæ, elementary and general laws. Weber's celebrated law is the most important attempt in this direction. Whatever we may think of their correctness, these attempts were made in the interests of a system which is full of attractions. It was impossible to get outside this magic circle after having once entered it. The road which was followed could never lead to truth, but to resist the current great freshness of mind was required; these phenomena had to be considered without any preconceived opinion, and one had to start from facts observed and not from what he had heard, read or learned. Such was the road followed by Faraday; he had heard it stated that, by electrifying a body, something new was introduced into it; but he saw that the changes observed were only external and not essentially changes modifying the nature of the body. He was taught that the active forces only traversed space, but he remarked that the nature of the matter which filled this space had the greatest influence upon them. Faraday had read that electricities existed and that their properties only were discussed, and yet he daily observed the effects of these forces without ever seeing anything of the electricities themselves; he therefore proceeded to reverse the proposition. The electric and magnetic forces became for him the only tangible reality; electricity, magnetism descended to the rank of objects whose existence is very contestable. Considering these lines of forces, as he calls them, he saw them as they manifested themselves in the form of potential, of eddies, of currents, without troubling himself with the question what they really might be. It was sufficient for him to have established their existence, to watch their mutual effect upon one another, to see them carry material bodies along with them, and propagate themselves by transmitting excitation from one point to another. To the objection that in an empty space there

can be no other condition but that of absolute rest, he might reply with the questions: Is there really such a thing as empty space? Does not the transmission of light compel us to consider it filled with matter? Cannot the ether which transmits luminous waves undergo modifications which we perceive in the form of electric and magnetic actions? Is there no relation between these modifications and these vibrations? Are not the luminous waves like the scintillations of these lines of force? Such were the hypothesis arrived at by Faraday, and to the scientific demonstration of which he applied himself with all his ardor. Researches on the relations between light, electricity and magnetism became the favorite object of his studies, and age alone set a term to his investigations. One of the principal questions which occupied him was to know whether the transmission of electric and magnetic forces was instantaneous or not. When the current excites an electro-magnet, is the magnet field established instantaneously to the very limits of space? Or, rather, does the action first reach the nearest points, and only gradually spread to remote points? If we modify rapidly the electric condition of a body, do all the points of space simultaneously obey the same variations, or, rather, is there a retardation, more or less great in proportion as the distance increases? In this latter case the effect of the variation would be transmitted through space like a wave. Do these undulations exist? Faraday did not succeed in answering these questions, and yet his theories have a direct bearing upon their solution. If there exist electric waves traversing space, the independence of the forces which produce them is demonstrated. We know that these forces do not traverse space instantaneously, for we can, from one moment to the next, follow their propagation from one point to another. The problems which Faraday set himself, so far from being insoluble, require but very simple experiments to be solved. If it had been vouchsafed to him to imagine these experiments, his theory would have triumphed from the outset. The relation between light and electricity would immediately have become so evident that it could not have escaped even a less practiced eye than his. But it was otherwise ordained. Experiments at first afforded no solution, and the prevailing theory was opposed to Faraday's ideas. By affirming that electric forces can exist independently of corresponding fluids, he contradicted the system generally admitted at that period. Moreover, the idea that the nature of luminous waves could be anything but elastic was rejected in optics. It seemed as if a discussion of either of these hypothesis could only be a sterile speculation. The deepest admiration we, therefore, owe to the man who knew how to bring into such agreement these two hypothesis apparently so far removed from one another that they lent each other mutual support, and served as the basis of a system, the likelihood of which could not be denied. This man was Clark Maxwell. His work, published in 1865, is known under the title, "Magnetic Theory of Light." It is impossible to study this theory without sometimes having a sort of sensation as if the mathematical formulæ were endowed with real life and special reason. They seem sometimes more intelligent than we ourselves, more intelligent even than the one who has established them; they hold more than he promised. This is not at all impossible; it is always the case when formulas are true beyond what is known in establishing them. But formulas so comprehensive could only be found by seizing upon the least particle of truth of which nature allows us a glimpse. We know the light which guided Maxwell. It is a phenomenon which had already struck other observers, and which Riemann and Lorenz had already made the object of similar, but less successful, hypothesis. This is it: Electricity in motion produces magnetic forces; magnetism in motion produces electric forces; these effects are only appreciable with very high speeds. The factor of speed, therefore, enters into the relation which connects electricity and magnetism, and the constant which determines this relation, and which always re-occurs in it, is itself a speed of enormous magnitude. The speed of electricity had been determined in different ways, first by Kohlransch and Weber, by means of purely electric experiments; and these extremely delicate researches had proved that it is equal to another remarkable speed—that of light. This could not be a mere coincidence, and Faraday's disciple Maxwell discerned that it must be owing to the fact that both electric forces and light are transmitted by the same medium—the luminiferous ether. The two speeds, which had been determined almost at the same time, could not be but equal, and the most important optic constant was from that moment introduced into electric formulæ. Maxwell strengthened this bond beneath the two classes of phenomena; he enlarged the formulæ so as to make them express, not only all the known phenomena, but, in addition to these, a whole class of hypothetical facts—electric undulations. He considered them as transverse waves, whose wave length might be of any magnitude, but which would be propagated through the ether with a constant speed—that of light. Maxwell then was able to show that there really exist in nature undulations possessing these geometrical properties, although we may not be in the habit to consider them as electric phenomena, and give them a special name—that of light. If we reject Maxwell's electric theory, we have no longer any reason for admitting his ideas with regard to light. In the same way, if we contend that light is a phenomenon of elastic nature, his theory of electricity becomes impossible. But if we study his system, without reference to current theories, the different parts will be seen to lend each other mutual support, just like the stones of a vault, and the whole seems a gigantic arch spanning an unknown region, and uniting two recognized truths. It is true that the difficult nature of the theory did not at once secure for it a large number of followers; but having once grasped its real meaning, one is bound to follow it up to its last consequences, and then only realizes the importance of its fundamental hypothesis. Experimental research was for a long time confined to some isolated propositions on the accessory parts of the theory.

(To be continued.)

THE SOLAR ECLIPSE.

THE PHENOMENON VISIBLE LAST WEEK IN SOUTH AFRICA ONLY.

If the weather in South Africa on Dec. 22, corresponded with the weather in this city, not only the $5,000 appropriated by Congress to defray the expenses of the corps of scientists selected to observe the solar eclipse on the Quanza River in South Africa, will have been expended without compensation, but the disappointment to the scientists themselves will be greater than can be measured by dollars. The expedition started from here on the man-of-war Pensacola on October 16, and arrived at St. Paul de Lonado on December 7. It is in charge of Professor David P. Todd, of Amherst College, an expert astronomer and naturalist. His first assistant is Professor H. F. Bigelow, a graduate of Harvard and professor of mathematics and astronomy at Racine College. Professor Eben J. Loomis, a graduate of Harvard and for the last forty years in the office of *The Nautical Almanac* at Washington, is the assistant astronomer and naturalist. Professor Cleveland Abbe, of the College of the City of New York, is the meteorologist. Professor L. H. Jacoby, of Columbia College, is one of the assistant astronomers, and he will also make researches in natural history. W. H. Brown of the National Museum is the osteologist and naturalist, and he will be assisted by his brother, A. H. Brown. E. B. Preston of the Coast Survey, will make magnetic observations and gather information about gravitation. H. S. Davis, of Princeton University is one of the assistant astronomers, and has charge of the adjustment of the instruments. C. A. Orr, of Clark University is the ethnologist and ornithologist. C. E. Van Guysling will observe the force and velocity of the winds and movements of the clouds. He took with him a large number of toy balloons to aid him in his work. J. E. Carbutt, from the University of Pennsylvania, is the photographer, and E. J. Wright is his assistant. Heli Chatelaine is the interpreter, and Dr. Bartlett is the apothecary and professional nurse. The instruments taken by the scientists comprise all varieties of portable astronomical, transit and solar photographic inventions, a large Clark equatorial telescope, a camera about forty feet long, twenty smaller cameras, jars, herbariums and insect cases for the preservation of rare natural history specimens and other instruments, all of the value of about $30,000. After landing at St. Paul de Lonado the scientists, with a guard of marines, went about seventy-five miles inland to Mapima, on the Quanza River, where the instruments were set up and adjusted preparatory to taking the observations. The total eclipse of the sun was only visible in a narrow path about 5,000 miles long and only 100 miles wide, extending nearly its entire distance over the ocean. It began in the Caribbean Sea, skirting the northern coast of South America, being visible at only one point there, French Guiana, where was stationed an expedition from the Lick Observatory of California. The line of the eclipse, from this point, moved eastward until it struck South Africa, a few hnndred miles south of the Congo River. After the observing party has finished with its work it will return home on the Pensacola, reaching here the latter part of January.

FEMININE COSTUME.

SHALL WOMEN BE ENCOURAGED TO ADOPT MASCULINE GARMENTS.

"Whether as the world grows wiser, women will eventually adopt men's dress, or wear it and womanly attire interchangeably, according to the occasion, is a question. Those who are ready to cry 'Impossible,' should study the masculine dress of men only a century ago. After centuries of brilliant dressing among those whose income allowed it, the sterner sex has turned to attire of simple cut and sober colors. That there is a tendency among women to assume male attire, as more convenient or as a disguise, the many newspaper accounts of women discovered in coat and trousers, which in some instances they had worn for years without betraying their sex, sufficiently evinces. Several distinguished women have dressed as men. Rosa Bonheur, the painter, works in full male attire and resumes her petticoats in the evening. Louisa Lawson, the sculptress, finds it convenient to wear trowsers and coat when at work. Sarah Bernhardt, in her studio, assumes a black velvet suit of clothes, in which she is conscious that she looks very charming. Mme. Dieulafoy, the French explorer and scientist, who has done so much to increase our knowledge of Persian archæology, also looks much more coquettish and winsome in the costume she adopted while journeying in strange lands, than in the skirts which she wears in Paris. Indeed, even in Paris, her only return to feminine costume is in the substitution of skirts for trousers. The coat and vest, the shirt, collars, and cuffs are retained. When traveling she disguises herself in a loose and long paletot. But one sees the woman in the feet and ankles, the hands and wrists, the pretty throat, and the small ears. Her light brown hair is cut close." Now that woman has entered the labor field to battle in the struggle for daily bread, the question of the most suitable dress for her working hours deserves some attention. We call ourselves a practical nation, and affirm that this age is distinguished above all that have preceded it for its materialistic, utilitarian tendencies. Yet every accident in which a woman's long skirts cause her to be whirled into death by catching in the machinery, is an evidence that if our claims be true, we have advanced but a lamentably short distance in the study of the fitness of things. The long

skirt is of the drawing-room, where woman is a thing of grace and beauty; where she receives the respectful homage of the coarser sex. But in the factory, she is but a worker, like the man; and her dress should assuredly be that which is best suited to her occupation. In the streets, too, there are many occasions when convenience, health, and security would be enhanced by the adoption of male attire. The failure of the "Bloomer" movement was due to the mistaken idea of its originators, who endeavored to render the costume popular, or fashionable, by putting it upon the market when there was no necessity for it. Should such a movement be started now, beginning where the need is most obvious, in the factories, it might have a better chance of success.—*Times and Register.*

BAROMETERS.

HOW THEY ARE MADE AND WHAT THEY RECORD.

If we plunge our hands into water, we feel a pressure upon it equal to the weight of the water above it. Every boy who goes in swimming knows how painful this pressure may become in the drum of the ear when diving in deep water. So, in the ocean of air which surrounds the earth and at the bottom of which we live, a pressure is continually operating with a force amounting to many tons, but, as it is exerted in all directions, both from the inside and outside of our bodies, we are not conscious of it. The pressure of the air is not constant, as would be the case with a column of water, but varies considerably from time to time, owing, principally, to air currents of varying temperatures and consequent density and similar meteorological causes. The average pressure may be conveniently stated as fifteen pounds to the square inch, or a pressure sufficient to sustain a column of mercury about thirty inches high. A barometer is simply an instrument for measuring the varying pressure of the air, and in its simplest form consists of a glass tube, closed at one end and filled with mercury, the lower open end of which dips into a vessel of the same metal, and provided with a scale to measure the height of the mercurial column. If the tube is more than thirty inches long, the mercury will fall away from the top, leaving a vacant space, which will vary in size from time to time, as the varying atmospheric pressure will balance the weight of a longer or shorter column of mercury. The empty space at the top of the tube is called the Toricellian vacuum, and is a very perfect one, containing only a little vapor of mercury. The popular notion of a barometer is that of a weather prophet, and it is assumed that its indications are uniform and certain in every case. Nothing could be further from the fact. It is true that the state of the weather is, to a large degree, dependent upon or varies with the atmospheric pressure, but the barometer simply indicates these variations of pressure, and their interpretation in connection with meteorological changes must be a matter of special study, and largely dependent upon local conditions. As a general rule, it may be said that an increasing pressure indicates the approach or continuance of fine weather, while a decreasing pressure precedes a storm or atmospheric disturbance, but this rule is by no means infallible, and not infrequently the reverse might be the case. It requires a skillful observer to properly interpret the barometric readings, and this is an unavoidable source of error in the government predictions, which are made up at a central point from observations transmitted by telegraph, and by a single official, who has no means of making allowance for movements due to local conditions alone. The actual manufacture of a barometer is a matter of considerable care and skill, a really good instrument costing from thirty dollars upward. The cheaper ones are equally good for noting the comparative changes of pressure, which is all that is usually required, but they are utterly worthless for giving the actual pressure. Great care must be taken in filling the tube, and the mercury is added in small quantities and kept at the boiling point (662° F.) during the process, to drive out the least traces of air. The instruments used for scientific purposes are provided with an accurate scale of inches and fractions, showing the absolute height of the top of the mercury column above the surface of the mercury in the reservoir at the base, and a vernier, by which variations as small as the thousandth part of an inch may be read off. Such an instrument would show the variations of pressure between two different floors of a building. It is by no means a simple matter to take an accurate barometric observation. Where absolute accuracy is required, the apparent height must be corrected, for the latitude of the place of observation, for the temperature of the air, for the expansion of the material on which the scale is engraved, for the capillarity of the tube, and for the height above sea level. Usually the latter correction only is necessary, but in certain investigations all these and others must be allowed for. Barometers are used to measure the pressure of the air, or other gases and vapors, in various physical and chemical investigations, and they play a very important part in the determination of the specific gravity and consequent molecular weight of different volatile chemical substances. One of their most important practical uses is in the determination of the height of mountain ranges, hills, etc. It is evident that the higher we ascend into the air, the less the weight above us, and, consequently, the less the pressure upon the mercurial column. Two barometers should be used, and observations taken simultaneously at the base and summit of the elevation, unless the time between the two observations is short. For ordinary purposes, it is accurate enough to reckon an elevation of 93 feet for every tenth of an inch depression of the mercury, but a more accurate formula for heights not exceeding 3,000 feet is:

$$X = 52494\ 3 \times \frac{H-H_1}{H+H_1} \times \left\{1+\frac{T+T_1}{900}\right\}$$

X equals the elevation in feet, H the height of the barometer at the lower station, and H_1 the height at the upper station. T and T_1 are the temperatures of the respective stations in numbers of Fahrenheit degrees above 32°. Aneroid barometers depend upon the same principle as the mercurial ones, but the atmospheric pressure is exerted upon a thin corrugated metal box, one side of which is connected by a system of gearing and levers with a pointer moving over a scale. The varying pressure causes the side of the box to rise and fall, and the movement is transmitted to the pointer. For ordinary purposes, aneroid barometers are sufficiently accurate and much more convenient than mercurial ones, but, where extreme accuracy is required, they cannot be used. A cheap form of barometer or weather indicator is extensively sold, consisting of a sealed glass tube containing a liquid in which some solid matter is partially dissolved. They are not of the slightest value, and are not affected in any way by a change in atmospheric pressure. The little "weather houses," where figures move in and out of different doors, depend upon the twisting or untwisting of the string of catgut from which the images are suspended. They are simply a rude form of hygrometer, which only indicates the amount of moisture present in the air, and are very unreliable weather prophets.

INGENIOUS CLOCK.—An electrician has just patented something as new as it is unique in the way of a clock. Aside from being a regular timepiece and daily calendar, it is also provided with a system of keys making a double circuit around the outside of the clock, the first one to denote the hour and minute, and the other the day of the month. The object is to furnish thereby a regulator for business appointments. For instance, if a man had an appointment at 9.10 o'clock this morning, he would turn the indicator to that time, and as well another to December 1. At the minute exactly this morning an alarm would be turned in, and would continue to ring until stopped. The clock is the first of its kind in America, and has been viewed with considerable interest by the jewelry trade.

DOCTORING AT HOME.

THE DANGERS OF INDISCRIMINATE HOUSEHOLD MEDICATION.

In an interesting account of a series of interviews of prominent pharmacists in this city, the *Sun* recently described a number of dangerous practices continually brought to the druggists attention in the prosecution of his daily avocation. These facts are in nowise new, but are nevertheless worthy of earnest consideration. The several articles published are of more than the ordinary merit of newspaper utterances, presenting the involved questions fairly and clearly. Taken first for consideration is the evil of "prescription borrowing." "Very prevalent is the practice of copying the prescriptions, which some physician has written for a patient, by people who imagine that they are suffering from the disease for which the medicine was given. A man or woman falls sick and concludes that the ailment is the same which afflicted a next-door neighbor a few months before. He or she borrows the medicine bottle which the latter used, has it refilled, and uses the contents with the feeling that he will be speedily cured, without the expense of medical advice and treatment. It would be very well but for two facts—the average individual cannot diagnose his own sickness; and, second, he does not understand the technical language in which all prescriptions are written. There is not much harm done in the first case. A hard drinker, whose ankle or toe is attacked by gout, imagines he is suffering from a sprain, and buys strong linament to relieve the latter. After two weeks of agony he becomes scared and goes to a physician, who soon puts him in shape. Another sufferer has erysipelas, and imagines it is hives or some other eruption, and is puzzled when the prescription he has borrowed does him more harm than good. Toothache is mistaken for facial neuralgia, coryza or cold in the head for influenza, rheumatism for sciatica, a sprain for pleurisy, and a cold in the kidneys for Bright's diseases. But far greater is the evil of copying prescriptions. These are written in various ways, according to the medical school in which the physician has been educated. There is hardly a single drug in the *materia medica* but can be written in six different ways. Even in stating the amounts to be used the doctor can use apothecaries' weight, the metrical system, avoirdupois weight, or arithmetical proportions, and can use as the signs of the quantities the words fully spelled, their abbreviations, their Latin, French, or German equivalents, or their chemical symbols. All this is incomprehensible to a person who has not had a medical and chemical education. For example, he copies a prescription by a French physician who uses the metrical system and orders a gram of a certain drug. He reads the word gram grain, so copies it, and gets only one-fifteenth of the quantity required; or, *vice versa*, he could make a far worse mistake, and get fifteen times the dose. Worse than this are the mistakes in regard to drugs themselves. *K* or *kal* is the abbreviation of *kalium*, the scientific name for potassium; *cal* bears the same relation to calcium; *kalk* is the German for lime. The three are very much alike to the untrained eye. As a consequence the prescription borrower writes an order for lime-water when he wants carbonate of potash, for chalk when he wants lye, and quick-lime for saltpetre. Although a man would not think of meddling with his watch or his clock, or any piece of mechanism, but would intrust its repair only to a competent workman, he often meddles with his own health and physical constitution in the most reckless way. He will take medicines that are only of use in some entirely different circumstances on the mere guess that his symptoms are the same as those for which the medicine was originally prepared. Women are particularly prone to do this. They fearlessly fill up old medicine bottles, and use them in cases where there is not the slightest analogy to the case for which the medi-

cine was originally prepared. They make the most reckless diagnoses. They exchange information as to what the doctors did for their children under what seem to them similar circumstances, and which may be entirely different. They may not know the difference between a common cough and membranous croup, but they will tackle the most dreadful disease with the most inappropriate remedy. This apparently growing propensity of people to prescribe for themselves should be checked. The drug store contains elements of destruction quite as dangerous as the gunpowder shop or the saloon, and not the least dangerous equipment is the pile of old prescriptions. People cannot be too strongly impressed with the fact that opiates are hurtful when used in excess, or when administered by unskillful hands. Intelligent physicians and conscientious druggists may do much to this end. Something may be done by careful administration of the laws regulating the sale of poisons. But not the least dangerous element in the baleful business is the indiscriminate use of old prescriptions, and self-doctoring by the ignorant."

CRIMINAL TYPES.

SOME PRACTICAL BUT UNSOLVED PROBLEMS OF HUMAN CHARACTER.

In Italy, during the last few decades, a number of scientific men, mostly physicians, have devoted themselves to a careful study of criminal types. Their point of view is a strictly scientific one; they regard a crime as the expression of a dangerous trait of character. The character is more important than the act. Moreover, the criminal is not a spontaneous, capricious product: he does not stand alone, but belongs to a class. Thus the anthropology of the criminal classes becomes a distinct object of study. Again, criminality is essentially a morbid phenomenon, and is a defect analagous to insanity or idiocy. In this respect the criminal is a psychological study. To characterize the spirit of this movement in a few words, one may say that it lays stress on the criminal rather than on the crime. Foremost among the representatives of this view is Dr. Lombroso, the editor of a journal devoted to this movement, and author of a comprehensive work on the defective classes. Dr. Lombroso has recently stated his theory of criminality in the *Nouvelle Revue*, and it may be worth while to take advantage of this convenient statement by presenting it to our readers. In general, one may recognize three types of causes of the outbreaks against the social order — physical, social and anthropological. Among the first may be mentioned climate. In the Argentine Republic the sharp changes of temperature favor a revolutionary character in the inhabitants. The season of year influences the amount of crime; crime predominates in the warm months. Of 192 revolutions in Europe, the months of June and July have the largest share; November and January the smallest. So, too, heat is a factor. Southern countries (Italy, Spain, Greece) have the largest number of revolutions; northern countries (Russia, Sweden, Norway) have the least. Geographical position and other physical causes could be added. As social causes, Dr. Lombroso regards the struggle for supremacy among the various social castes or classes, a disharmony between the existing civilization and the prevalent economic conditions, an opposition between the political forms and the national feeling and needs. Such are the more constant occasions of revolutionary outbreaks, as shown in history. Mere accidental circumstances, such as the appearance of a great leader or writer, must also be considered. Finally, the following are the prominent anthropological causes: the co-existence of races not readily assimilated, with, perhaps, a tendency to political changes; hereditary anomalies of character, such as criminality and moral insanity; or acquired anomalies, as alcoholism and insanity. All these go to form three classes of political defectives—criminals by heredity, by habit, and by mental disease. These have furnished the subject matter to the new science of criminal anthropology. One must not suppose that, because these criminals are classed under the insane, they will not be active in political crimes; for though they may be men of small intellect, yet the absence of the restraining power of a well-developed moral sense makes the bridge between thought and action shorter and smoother. A mere fanciful conception of possible crimes will take so strong a hold on their minds that the act itself will follow. More sensible and reflecting criminals would be repelled by the consequences and dangers of the act. In addition to this class of criminals, who become breakers of the peace simply because that happens to be the most accessible method of venting their perverse instincts, there is another class, who are led on by a wild passion for the destruction of the old, and the creation of something new. They need restless activity; their present condition seems the worst possible. As a rule, too, they are very fond of notoriety. They are in love with crime. The pain of others is a keen satisfaction to them; its horror attracts them. The French Revolution shows such types. Lejeune made a little guillotine, and used it on the chickens destined for his table. Jean d'Heron wore a human ear as a cockade on his hat, and had others in his pocket. Carrier confessed that the writhings of the priests whom he condemned to torture gave him exquisite pleasure. The modern socialists, anarchists and dynamiters no doubt contain an element of these hereditary criminals, who use the political object as a mask for their instinctive tendencies to lawless outbreaks. The socialistic and the criminal types of face present strong resemblances. In some cases the introduction of such a criminal element transforms a purely political organization into a band of outlaws; the Molly Maguires are an example of this. All these facts urge the study of these defective classes. Society has a right to defend itself against these enemies of all peace and progress. But the punishment must be directed to the removal of the evil. The born criminal can readily be detected; his craniological peculiarities, the absence of a moral sense, the reckless cruelty of his deeds, point him out. The treatment for these must aim at removing all opportunities of indulging their passions, for meeting others of their kind (for the epidemic contagion of this disease is one of its worst characteristics), for bringing into the world others fated to follow in their footsteps. For their children houses of correction and careful discipline should be at hand. The relation between insanity and crime is one both of cause and of effect. Esquirol has shown an increase of insanity and suicides at each outbreak of the French revolution. Lumier declares that the excitements of 1870 and 1871 were the more or less indirect cause of seventeen hundred cases of insanity. This simply means that the same morbid element, tending to pronounced insanity in one direction and to pronounced criminality in another, is brought to the front by a common cause. Very frequently, too, both tendencies can be seen in the same individuals. Marat, for example, had attacks of maniacal exaltation, and a passion for continually scribbling. He had a sloping forehead, was prognathous, had a prominent jaw and high cheek bones, and a haggard eye, all of which correspond closely with the insane type of face. Later his delusion of ambition changed into one of persecution and homicidal monomania. Dr. Lambroso cites case after case, all telling the same story. He includes Guiteau in this list, and agrees with the opinion of an Italian alienist, that his trial was simply "scandalous." The real place for such beings is in a much-needed institution—an asylum for insane criminals. A few words as to criminals who have acquired their sinful traits. Alcohol is the most common cause. This always plays a prominent *rôle* in political outbreaks; the French revolution is no exception. Here is another great practical problem needing solution.

A Great Map.—The great geological map of France, commenced in 1852, has just been completed, making forty-eight sheets.

FOOD AND FORTUNE.

RELATIVE IMPORTANCE OF COOKS, AUTHORS AND POLITICIANS.

George T. Downing, the keeper of the Congressional restaurant for many years and a man of considerable wealth, was an orator of no mean ability. Many's the lecture he delivered, for each of which he received a round $200. That he should have devoted the major portion of his time to providing food for men's stomachs when he was well fitted to dispense intellectual pabulum excited much comment among his friends, one of whom asked him pointedly why he did not renounce the kitchen for the library. "I seek the dollar, and there is more money in the restaurant than in the field of literature," was the answer of this cultured African. And then he added that men of all degrees of culture as well as those lacking it altogether entertain higher opinions of their cooks than of their lawmakers. "Every man is the gourmand in degree. My popularity is due solely to the fact that I can prepare and serve palatable dishes. The world is full of literateurs and orators, but good cooks are not easy to be found." Adirondack Murray, the versatile Boston preacher—who in the palmy days of his pulpit sway was termed the "Beecher of the Hub"—after his retreat South went to Montreal and engaged in the same business as Downing, being in no sense ashamed of his calling, declaring that eating is the chief necessity of life and that there are honors for the caterer as well as for the author and statesman. However, the hero of the New York mountains lacked the latest requisite for the management of a first-class cuisine. At Washington there lived for many years, and finally died, a bookseller named Taylor. Mr. Taylor had a son in the army and another in the navy, both of high rank and most estimable gentlemen. The bookseller, a man of high literary tastes, placed eating at its proper estimate, rightly declaring that the good eater is the happy man. He wrote a book, his only published writing, in which he recited all he knew of table anecdotes. The volume, now very scarce, abounds in charming little stories of great men's table weaknesses. All will recall the hope expressed by Mr. Pickwick's friend that the jury in the Burdell breach of promise suit had had a good breakfast. One of the most successful lobbyists who ever lived said, after twenty years of contact with senators and representatives at Washington, that he never talked with a hungry man. "I take them at dinner or immediately afterward. Your hungry man is savage and little disposed to grant a favor."

Sampson's Secret.—For the benefit of those who abhor printers' ink as a prime factor to the advancement of their interest, we should state that Sampson—the strong party—was the first man to advertise. He took two solid columns to demonstrate his strength, and several thousand people "tumbled" to the scheme. He brought down the house.—*Democratic Union.*

A Monster Kite.—A party of young men in Terryville, Conn., own probably the largest kite in the country. The kite is 16½ feet high and 12 feet wide. The frame is bolted together with iron bolts and is covered with 54 yards of canvas. To balance this weight requires a tail 140 feet long, weighing 50 pounds. The canvas is attached to the frame by hooks and can readily be removed, the frame folded up and transportation made easy. It is proposed to give the whole a coating of asbestos to render it fire-proof, and in summer to utilize it to give exhibitions of fireworks, which can be so arranged as to be discharged in mid-air with the aid of a slow match or fuse. The trial trip took place early in December. A heavy clothes line was attached and fastened to a light road wagon, in which the five young men seated themselves. A good stiff breeze was blowing, and the immense kite rose gracefully into the air. It required the combined strength of the five to hold it. When it had reached a height of 2,000 feet it was held there, and the wagon was pulled over the country roads for a distance of four miles at the rate of about nine miles an hour. The shafts of the wagon had been removed and an ingenious arrangement of ropes was used to guide it by.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

January.

MEAT.—Beef, mutton, pork, veal.

POULTRY AND GAME.—Chicken, duck, turkey, geese, rabbit, hare, partridge, pheasant, wild fowl, pigeons.

FISH.—Brill, carp, cod, eels, salmon, whiting, haddock, oysters, lobsters, smelt.

VEGETABLES.—Brocoli, beet, cabbage, carrots, celery, onions, parsnips, turnips.

FRUITS.—Apples, pears, oranges, bananas, lemons, nuts.

PRACTICAL RECIPES.

LARDED ROUND OF BEEF.—Have the bone taken out of a small round of beef, then lard it very thickly with long strips of fat bacon, dipped first in vinegar and then rolled in a mixture of grated nutmeg, black and white pepper, one or two cloves pounded, some salt, parsley, chives, lemon, thyme, marjoram and savory, shred finely. Now put the meat into a stewpan with two calf's feet, a pint of broth, and half a pint of water, together with some salt; set it to boil and then skim it; then add two or three carrots, two or three onions, two or three cloves and a faggot of sweet herbs; cover up the stew pan very tightly and let it stew gently for six hours.

VEAL AND MACARONI.—Slice a large fine onion and fry to a light brown in three tablespoonfuls butter in a stewpan; remove the onion and put in the pan about two pounds of veal cut from the leg; brown well; add a cupful of tomatoes and cover with stock; cook gently till tender, adding four or five whole cloves and two bay leaves; when done thicken the gravy with a little browned flour; boil a pound of macaroni for twenty minutes in salted water; drain; put the veal in the center of a platter, pour over it the gravy, and arrange the macaroni about the edge of the fish.

GERMAN ROLLS.—To one pint of hot milk add two ounces sugar, three ounces butter, two saltspoonfuls salt; stir well, and when cool add the beaten whites of three eggs; sift together a heaping quart of flour, three heaping teaspoonfuls of Horsford's baking powder; mix all together and roll out the dough moderately thin, brush over it a thin layer of creamed butter, next a dust of sugar from the dredger, then a layer of well-washed currants, and finally a liberal sprinkling of cinnamon; do the work briskly; roll the paste as for jelly roll, cut off inch slices and put them on buttered tins; cover with thin paper and bake; remove the paper after fifteen minutes, and when the rolls are brown remove from the oven; while hot brush a little butter over the tops of them.

ORANGE JUMBLES.—Rind and juice of two sour oranges (rind of one only, if preferred); grate the rind; one and one-half cupfuls finest granulated sugar, one egg, one-half cupful butter, one-half cupful cream, sour and thick, one teaspoonful soda dissolved in the cream, enough flour to enable you to roll out; cut with hole in center, sprinkle with sugar and bake in a quick oven.

APPLE PUDDING.—Stew four apples with sugar to taste; add one ounce of butter, stirring it in thoroughly while cooking; when cold add one egg, well beaten; butter a baking dish, strew bread crumbs all over, and fill in your mixture; strew some bread crumbs over the top, and bake it in a moderate oven; when baked turn it out on a dish and put powdered sugar over it.

ANCHOVY SALAD.—Having washed and drained some salted anchovies, carefully remove their filets, and put the fish in a salad dish; add to them some chopped hard-boiled eggs, a few capers and a little chopped parsley; pour over all a dressing of oil and vinegar without salt.

CHOCOLATE CAKE.—Two cupfuls sugar, one cupful butter, one cupful milk, three cupfuls flour, whites of twelve eggs, well beaten, two teaspoonfuls baking powder, one teaspoonful vanilla; bake in layers.

FILLING.—Melt four ounces chocolate; beat the whites of two eggs and add to them gradually four tablespoonfuls powdered sugar; beat till stiff; add chocolate, gradually beating well; flavor with vanilla.

BUYING AND REFILLING BOTTLES.

By an act of Congress it is provided: "That any person who shall with intent to injure or defraud the owner of any trademark, or any other person lawfully entitled to use or protect the same; buy, sell, offer for sale, deal in or have in his possession any used or empty box, envelope, wrapper, case, bottle or other package, to which is affixed, so that the same may be obliterated without substantial injury to such box or other thing aforesaid, any trademark, registered pursuant to the statutes of the United States, not so defaced, erased, obliterated, and destroyed so as to prevent its fraudulent use, shall on conviction thereof, be punished by fine not exceeding one thousand dollars, or imprisonment not more than two years, or both such fine and imprisonment." This law is very clear and emphatic. Under it no person has a right to buy up the used bottles, which contained Lea & Perrins' Worcestershire Sauce because this trademark is registered and blown in the bottle so that it cannot be obliterated. It does not matter if he puts on another label entirely different from the genuine. The mere having in his possession any of these trademarked bottles filled with any other than the genuine sauce makes him liable. We understand that Messrs. Lea & Perrins have sent out peremptory instructions to spare no money or labor to ferret out and punish these evildoers.

THE CURE OF CATARRH.

So common is catarrh in the United States that it has more than once been called the American disease by foreign physicians and travelers who have bestowed attention upon the subject. While the reproach is a trifle too sweeping, it is largely borne out by the facts. The malady is found everywhere from the Atlantic to the Pacific and from Canada to the Gulf of Mexico. To a certain extent it is the result of climatic forces, being found chiefly in the territories where there is the maximum amount of changes in the weather. The New England, Middle, and Western States show a much larger number of cases than the South, Southwest, Pacific and Northwestern States. However great may be the influence of climate in its causation, a much more powerful factor is human ignorance and carelessness. Though catarrh starts with a cold or a series of colds, these are merely incidental. Behind all is an impure blood and an unhealthy system. They permit the contracting of a cold at the start, they increase the local excitement, irritation and inflammation as the malady progresses, and they bring into being the morbid condition of the tissues which renders catarrh so difficult of cure. It is evident that as long as the blood remains corrupt there can be no real cure of the disease. Nostrums may afford temporary relief, powerful narcotics may reduce or even destroy the pain for a brief period, chemicals and drugs may alter the symptoms and give the appearance of betterment; but, in the long run, no good is done and in almost every case harm is the speedy result. It has been repeatedly said that the worst cases of catarrh known are those in which corrosive substances have been employed in the treatment of the malady. Those instances in which the bones and delicate tissues of the nose have been eaten away, those in which deafness, loss of voice and disfigurement have occurred, and those in which the disease has brought on consumption, premature decay, and early death have almost invariably been brought about by the reckless use of powerful chemicals, locally applied.

It is owing to these facts that there has justly grown up in the minds of the American people a profound suspicion and contempt for "catarrh cures" of almost every type. It cannot be said too often or too vigorously that catarrh is a constitutional and not a local disease, and that the only treatment which is of any avail must be constitutional. The cleansing of the parts affected is right and proper; the application of narcotics under medical advice may be often of the highest service; but first, last, and most important of all are the purification of the blood and the expulsion of all humors from the system. The moment this is accomplished the chronic inflammation begins to diminish, the secretion of the fluids both normal and morbid to grow smaller, the irritated tissues to regain their tone and natural activity, and the sore surfaces to heal over and become as they were before.

In this process of purification there are many valuable auxiliaries. Bathing can not be too highly esteemed in this respect, provided two points are borne in mind. One is the avoidance of cold water. This creates a shock and shuts the pores. Warm water is grateful to the pores, softens the skin, opens the pores, and stimulates the little glands which serve to lubricate the exterior of the body. Best of all are the Russian, Turkish, and Roman baths. They are of vast benefit in catarrh as in nearly all other diseases. The other point in hygienic bathing is the avoidance of strong soaps. The practice of covering the body at every bath with a thick layer of alkaline lather, which eats out all the natural oil of the skin, cannot be too strongly condemned. It is better to use none at all, as many German dermatologists recommend. Best of all is a non-alkaline soap, a little borax, or a few drops of ammonia. Exercise, fresh air, sunlight, good reading, pleasant company, regular hours and amusement are also superb medicines to him who suffers from catarrh. But above all is the necessity for purifying the blood. This can only be accomplished by some combination of medicinal principles which will affect every organ and every tissue. There are many preparations which almost effect this result; but only one, Ayre's Sarsaparilla, which does it completely. It is not a mysterious patent medicine whose ingredients are unknown; but a simple scientific, combination of Honduras Sarsaparilla, Yellow Dock, Stillingia and podophyllin combined with the double iodides, as recommended by every physician and chemist the world over. It cleanses the system, renovates the blood, stimulates every function, and expells every humor from the body. The sufferer from catarrh who uses it finds his malady grow smaller every day and in a short time is troubled no more. It cures the disease by curing the unhealthy condition which made the disease possible. In Ayre's Sarsaparilla is the only real cure known for catarrh.

BUSINESS NOTES.

A SEASONABLE REMEDY.

We are very glad to mention an article of deserved merit and that has proved itself, after a number of years, to be a very important and valuable therapeutic agent in the treatment of a class of diseases that are very difficult to control. We believe we may hazard the opinion that Scott's Emulsion of Cod Liver Oil with Hypophosphites stands at the head of the list, as a remedial agent in the treatment of anæmia, scrofula, consumption and its kindred diseases. Its perfection as an emulsion and its palatableness certainly commend it to the medical profession.

FOR ABUSE OF ALCOHOL

Use Horsford's Acid phosphate. Dr. W. E. Crane, Mitchell, Dak., says: "It has proven almost a specific for this disorder; it checks the vomiting, restores the appetite, and, at the same time allays the fear of impending dissolution, that is so common to heavy drinkers."

BURYING FRUIT.—A "fruit silo," it is said, is an excellent idea adopted from Italy into some orange-growing countries. The fruit is cut from the tree and wrapped in tissue paper; it is then buried in sand, three tiers deep only, and the wrappers not touching. This method has fine results in the preservation of fresh fruit for a time of scarcity.

KANAKA SUGAR.—Three large sugar plantations are soon to be started in the Hawaiian Islands—one at Makaweli, on Kauai, one at Pearl River, on this island, and the third at Honolulu, Maui. The two former require water to be provided at very heavy cost, but that on Maui, has abundance of rain and river supply. No better locations can be found on these islands than those named, but the three enterprises will call for an outlay of at least two or three millions of dollars.

THE MAMMOTH PERIOD.—At a recent meeting of the Scientific Society of Copenhagen, says *Nature*, Professor Steenstrup gave an account of the results of his examination last year of the great mammoth deposit at Predmost, in Moravia. Dr. Wankel and Professor Maschka, who have devoted much attention to the subject, are of the opinion that the mammoths whose remains were found in this district were killed by man, and that their bodies were dragged thither to be eaten. Professor Steenstrup, on the contrary, holds that the mammoths themselves sought the locality, and that they must have died from want of water, or from some other cause with which man had nothing to do. The splits in the remains are due, he thinks, to the action of water and sand, and afford no support to the notion that the knuckles were cleft for the sake of the marrow. It is certain that some of the bones have been exposed to the action of fire, but Professor Steenstrup maintains that the traces of fire may be due to the fact that fires were at one time lighted upon them. On some of them decorative lines have been scratched, but these may have been made long after the mammoth was extinct in Moravia. The lines, according to Professor Steenstrup, are identical with the ornamentation of pottery of the neolithic age.

THE PHONOGRAPH.—The phonograph seems destined to play an important part in the future, and it is being utilized in all sorts of ways, both "useful and ornamental," according to an exchange; if half of what the inventors claim for it comes true the children of the near future are going to have some wonderful toys. Inventors are now at work on a long list of nursery wonders, in all of which the new mechanism is to be the main feature. The phonographic doll will talk, laugh, cry and sing like a human being. Noah's arc will contain a drove of neighing, braying, lowing, barking, mewing, hissing, cackling creatures that will rival a menagerie. The song notes of fine singing birds have been preserved on metal slips and the results combined, so that one may have a papier-mache canary, which will require no attention and will sing with many times the volume, and at many times the length, of any bird that ever lived. Mothers, too, have the promise of a phonographic cradle, at the head of which the wonderful mechanism is placed that will sing sweet lullabies by the hour to the fretful infant, soothing it and its tired parent to sleep at the same time.

SKIN PENCILS.—A Nuremburg manufacturer has invented pencils in blue, black and brown for writing on the human skin. They are for use in anatomical and chemical demonstrations.

BIG POWER.—France claims the honor of utilizing the highest water power in the world. At Brignond a turbine 9 feet 10 inches in diameter was put in operation in 1875, utilizing a head of 1,638 feet. It is still working and gives a force of 1,500 horse-power, with a flow of 300 litres of water per second.

PAINLESS EXTRACTION.—Drs. Henoque and Fredel, in a communication made to the Biological Society of Paris, state that the extraction of a tooth may be rendered painless by spraying the neighborhood of the external ear with ether. The anæsthesia of the trigeminus so produced extends to the dental nerves, and thus renders the production of general anæsthesia needless.

AUSTRIA'S ADULTERATIONS.—Austria is a country where one's food needs to be tested in order to avoid adulteration. At the laboratory in Vienna, where food is analyzed for nothing, a loaf of bread was found to consist largely of the pulverized bark of trees, sawdust and chaff; ground pepper was found to be mixed with wood ashes; cinnamon was colored with ochre; and a so-called "nutricious coffee" consisted entirely of roast acorns and chicory.

A LONDON BREAD TRUST.—A company is in process of formation, if not already closed, to control the price of bread all over the city of London. It or its projectors have secured nearly three hundred old established bread shops, a big bakery and three steam flourmills, the net profits on which are stated to have exceeded $450,000 per annum, and it is expected this income will be largely increased by raising the retail price of the staff of life to all consumers who are unfortunate enough to be at the tender mercy of the "union."

HOW LONG TO SLEEP.—Up to the fifteenth year most young people require ten hours, and until the twentieth year nine hours. After that age everyone finds out how much he or she requires, though, as a general rule, at least six to eight hours is necessary. Eight hours' sleep will prevent more nervous derangements in women than any medicine can cure. During growth there must be ample sleep if the brain is to develop to its full extent; and the more nervous, excitable or precocious a child is, the longer sleep should it get, if its intellectual progress is not to come to a premature standstill, or its life cut short at an early age.

AS TO BREATHING.—A boy, 14 years old, handed in the following as a composition on "Breathing." The instruction was "Tell all you can about breathing." "Breath is made of air. We breathe with our lungs, our lights, our liver and kidneys. If it wasn't for our breath we would die when we slept. Our breath keeps the life agoing through the nose when we are asleep. Boys that stay in a room all day should not breathe. They should wait till they get out doors. Boys in a room make bad, unwholesome air. They make carbonicide. Carbonicide is poisoner than mad dogs. A heap of soldiers was in a black hole in India, and a carbonicide got in that there hole, and nearly killed every one afore morning. Girls kill the breath with corosits that squeeze the diagram. Girls can't holler or run like boys because their diagram is squeezed too much. If I was a girl, I had rather be a boy, so I can run and holler, and run and have a great big diagram."

UNDER THE CHIN.—You may have heard travelers scoff at the practical Frenchman who stuffs one corner of his napkin inside his shirt-collar and spreads it fully over the front of his person from his chin down to his knees, writes Theodore Child in *Harper's Bazar*. This is the practice of the French people of the middle and lower classes, who are thrifty and prudent, and who wish to eat at their ease and not spot their clothes. There is nothing ridiculous in this practice. There is a reason, and an excellent reason, for so spreading the napkin, and if I were dining at home, or alone at a restaurant or club, and had on my spotless shirt and open waistcoat and clawhammer coat, all ready to go to the opera, I should certainly spread my napkin over my manly and snowy bosom, just as the Frenchman does, and so I should dine at my ease, serenely and without care, knowing that I had thus insured the immaculateness of my linen. However, let it be remembered that company manners in all countries require you simply to spread your napkin loosely over your knees, and to eat cleanly and decently.

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CONTENTS.

THE OKRA FIBRE.

An English investigator claims to have discovered wonderful possibilities in the well known okra, or gumbo plant of the South. His name is Sudlow, and he is a resident of Columbia, S. C., where for the past two years he has been studying the okra fibre question and reached the conclusion that it can be cheaply produced, and that the okra stalk is essentially different from the jute, cotton and ramey in this that the wood surrounds the fibre, while in the others it is mixed with it, and this is the key to the problem of cheap production. His experiments last summer and fall prove that the okra fibre and wood are naturally separated. The mixing of the fibre with the wood of jute, ramey and cotton makes it necessary to employ manual labor chiefly to decorticate it, and this is so costly that only in India and China, where labor is excessively cheap, is it possible to produce the fibre at low prices. The okra on the contrary can be separated by machinery. Mr. Sudlow declares that he can make a machine which will not cost more than an ordinary cotton-gin, and which can be employed as gins are employed on each large farm or in each neighborhood, and that by its use planters of okra can turn out their fibre and sell it as they do cotton, for so much a pound. Into this machine the okra stalks will be fed butts forward, and it will cut the wood from the fibre. The gluten will be removed from the fibre by a simple process, and the fibre will then be ready for the market. Some beautiful samples have been exhibited. The fibre is long, exceedingly strong, fine, between straw color and white, and with a silken gloss. The okra plant resembles large cotton. It grows in South Carolina almost without cultivation. A farmer in Edgefield County says that he can now prepare the fibre at a cost of one cent a pound, and a factory has applied for all he can make at a good price. The fibre can be subdivided, so that cloth, as well as rope and bagging, can be made from it. Secretary Rusk says that it is a fine fibre, and asks for the process of making it. It promises to become an important industry and to surpass either the cotton, jute or pine straw as a bagging for cotton.

THE CAUSES OF COLDS.

Physicians of wide professional experience and observation do not hesitate to assert that in the season of colds the huskiness and loss of power of articulation then so prevelant are largely due to the use of steam for heating—the steam failing of proper regulation, and the temperature thus becoming too high; under these circumstances, a person living in such an atmosphere has all the cells of the lungs opened, and, when passing into the open air is unduly exposed—this affliction being quite common among men who occupy offices in the new buildings which are fitted with all modern improvements. Further, the substitution of electric light for gas has wrought a change to which people have not yet adapted themselves; that is the heat arising from a number of gas jets will quickly raise the temperature of a room, and, unconsciously, people relied upon that means of heating to some extent. Very little warmth, however, is produced by the electric light, and by a person reading by an incandescent light, a feeling of chilliness is experienced. Briefly, too hot during the day and too cold at night are the conditions to be avoided.

THE VEST COMMITTEE.

AN AMUSING DEMONSTRATION BY THE ANTI-DRESSED BEEF FACTION.

Every few days newspaper readers have been regaled with a report of a session of the "Vest Committee." These reports are made more or less interesting by an air of importance with which they are surrounded, by frequent dire threats against apparently unwilling witnesses which no one has ever heard of being executed, and last, but not least, by a very apparent attempt on the part of some one to have it appear to the people that this mysterious committee is the great champion of the people's rights against a host of imaginary wrongs inflicted upon them by a lot of monopolists who, as railroad managers, stock yard and stock car companies, beef dressers, meat dealers, etc., etc., are represented as brobdingnagian ogres and the people as the pigmies who, were it not for this Vest Committee, would be immediately eaten up by these ogres. It may be doing the readers of the AMERICAN ANALYST a service, then, to throw a little light upon this committee and give a view of some of the hidden springs so cunningly concealed behind their dignified chairman. The committee is composed of Senators of the United States, and was appointed as a select committee on the transportation and sale of meat products. The necessity for the committee arose from the unfriendly legislation in foreign countries against American meat products, and while the committee has done absolutely nothing to advance American interests in that direction, it has gone a great deal in the opposite direction, by allowing American meat producers to be grossly misrepresented before it, and thus weakening not only American but foreign faith in the products. The committee consists of Senator Vest, of Missouri, as chairman, and Senators Plumb, Manderson, Cullom and Coke as members. Last week they held a session of several days at the Hoffman House in this city (Uncle Sam generously pays the bills), trying professedly to find out why beef cattle are so cheap and yet meat is so dear to the consumer. A ten-year-old boy could put questions that would elicit direct answers more to the purpose than Senator Vest does. This gentleman's examination of witnesses reminds one constantly of the cross-examination of an opposing witness in a country squire's court by a young and ambitious country lawyer, posing before the usual audience at country trials of five dollar cases in a tavern bar room for the time being metamorphosed into a court room. Mr. Vest has evidently concluded that, right or wrong, he will be on the popular side, and that this popular side is the one which always clamors against monopolies, the rich getting richer and the poor poorer, and is always ready to dilate on glittering generalities, because when brought down to specific logic he knows that he will be found sadly wanting. In his examination of the witnesses he did not hesitate to argue with the witness, ask irrelevant questions and try by innuendo and other questionable ways to twist the testimony to suit his purpose. He pretended great astonishment when plainly told that an experienced man in the business, known to be responsible, could make contracts with steamship companies which could not be had by every tramp. Then Mr. Vest played his trump card by asking: "We have taken testimony to the effect that the price of cattle has been going down steadily for years, and that it is now so low that producers are going out of the business. How can this be, when the price to the consumer remains as high as ever?" He has asked this question so often that he knows precisely

what the answer will be; but this answer he does not relish; it does not suit his purpose; it will make no capital for demagogues. The answer, of course, is that there is a vast difference in the weight of the live animal and the dressed meat; that the proportion of prime cuts, which are most in demand and which command the highest price, is so small that no reasonable man can expect a proportionate decline in the price of these prime cuts. Another point which Mr. Vest thought he could make, but was badly sat down upon, was about private companies' stock cars for the better transportation of live cattle. Everybody knows, and Mr. Vest must be stupid, indeed, if he does not know, that cattle transported in these patented stock cars come to market in better condition than in the old-fashioned cattle cars; hence, farmers are perfectly willing to pay extra for the use of such cars, just as Mr. Vest pays extra for riding in a Pullman car (we doubt if he pays for it, though he always rides in palace cars). The next ludicrous attack by Mr. Vest was made on several wholesale meat dealers by the old dodge of questioning them on mental arithmetic relative to the profit on meat, but as the answers were not to his taste, he attempted ridicule, thinly disguised as sarcasm; but he met more than his match in our New York butchers who, though they may never have had a seat in the United States Senate, are possessed of common sense enough to parry such questioners as Senator Vest, and of sufficient dignity to ignore his insulting innuendoes. And so this farce went on. Mr. Vest, by misquoting and garbling one witness's testimony to another, tried in vain to gain some admission that might help him. Witness after witness conclusively showed that Senator Vest's position was wrong, but he would not see it. We will add a little information for the committee's benefit, not that we expect them to take any notice, for there are none so blind as those who won't see, but that they may not have the excuse that they were not told of it. The information is from an interview with an experienced dealer at the Chicago stock yards, and bears the best evidence of truth from its being good common sense.

INTERVIEW WITH A CATTLE MAN.

Q. How do values of cattle compare to-day with one year ago?

A. Strictly choice cattle, weighing 1,400 and over, are about one-half cent per pound higher than one year ago. Cattle of less than choice quality are selling about the same as one year ago.

Q. How are values of cattle to-day compared with four years ago?

A. Strictly choice cattle, weighing 1,400 and over, are worth as much now as four years ago. All other kinds are lower, and will, I think, average one cent per pound lower.

Q. What is the cause of the decline?

A. There are various causes. First, the exceeding growth of the cattle industry; second, the repeal of the duty on hides, which has very much stimulated the importation of foreign hides, lowering the price of domestic hides on an average of three cents per pound, equal to $2 per bullock. Then, again, the oleomargarine tax amounts to about $2 more per bullock. The above deductions have to be borne by the producers of cattle. And there is another element which is not generally understood. England, Denmark and other lands have followed our example in the butterine legislation, making it a law that all hotels, boarding-houses and restaurants using oleomargarine or butterine on their tables shall post a notice to that effect in their dining-rooms. This law is being rigidly enforced, which very much depresses the price of oleomargarine.

What a pity that the Senate of the United States should be so handicapped by a chairman of an important committee, mistaking his vocation and frittering away valuable time in petty attempts to make a little political capital for himself out of so important a subject. There is only one consolation. Senator Vest has dug his own political grave, and so deep that after this brief experience of his little temporary power, he will never be heard from again.

ELECTRICITY AND LIGHT.

EXPERIMENTAL PROOFS OF THEIR IDENTITY.

[*Paper read by Professor H. Hertz, at the Medical Congress in Heidelberg, September*, 1889.]

(*Concluded.*)

I have likened Maxwell's system to an arch which spans an abyss of unknown things. If I may be allowed to revert to this image, I would say that, to strengthen the vault, one could for a long time only strengthen its two buttresses. Thus it was enabled to support itself, but its span was yet too large to erect on it, as a solid foundation, a new structure. To accomplish this, pillars rising from the ground must support the very centre of the arch. The demonstration of the possibility of obtaining directly electric or magnetic effects from light would have constituted one of these pillars and confirmed the theory. This discovery would have strengthened immediately the optical part of the theory, and indirectly also the electrical part. The demonstration of the existence of electric or magnetic waves, propagated after the fashion of luminous undulations, would have constituted another argument of the same importance. It would have confirmed directly the electrical, and indirectly the optical, part. The completion and the symmetry of the structure require the erection of two pillars, to which we liken these principles, but a single one suffices for our first needs. The construction of the first has not yet been attempted; as to the second, after many researches, a solid and ample foundation has been laid for it; part of the pillar already rises above ground, and, thanks to the co-operation of a crowd of workers, it will soon reach the summit of the vault, and will enable it to support the weight of the structure which is to be built on it. I have been fortunate enough to take part in this portion of the work, and it is to this circumstance that I owe the honor of submitting to you to-day my investigations; you will pardon me, therefore, if I proceed forthwith to call the attention of my hearers to that particular part of the structure. Unfortunately I shall be prevented by lack of time from entering upon the researches of a large number of explorers, and I shall not be able to show to what extent my experiments had been prepared by my predecessors, and how near some of them had even come to a definite result. Was it really so difficult to demonstrate that the propagation of electric or magnetic forces was not instantaneous? Should it not be possible to discharge a Leyden jar, and to observe if the oscillation of a distant electroscope was produced with a certain retardation? Should it not suffice, for the same purpose, to observe a magnetic needle whilst an electromagnet was being excited at some distance? In fact, these and similar experiments have been made, without, however, being able to prove that an interval of time elapses between the cause and the effect. For a follower of Maxwell's theory this failure is inevitable, and arises from the enormous speed of transmission. We cannot watch the discharge of a Leyden jar, the excitation of a magnet beyond a moderate distance, say of ten metres? Now, light, like electricity, according to the theory, traverses this space in one thirty-millionth part of a second, and such a short interval of time can be neither observed nor measured directly. Moreover, we do not even possess any signal for clearly marking such an interval. When we wish to take a length measure up to one-tenth of a millimetre, we do not mark the commencement with a large chalk mark. If we wished to determine time to within one-thousandth of a second, it would be absurd to mark the beginning by sounding a big bell. The time necessary for the discharge of a Leyden jar is, for our ordinary means of observation, infinitely short. This does not mean that it is not equal to one thirty-millionth of a second; and in our case this would be more than a thousand times too long. But nature has supplied another expedient. It has been known for a long time that the discharge of a Leyden jar is not uniform, but is composed, like the sound of a bell, of a number of vibrations, of partial discharges succeeding each other, at very regular intervals. Electricity is therefore capable of imitating elastic phenomena. The duration of each vibration is very much shorter than that of the total discharge; one vibration may therefore be taken as a starting-point. Unfortunately the shortest vibrations observed are of one-millionth of a second. During the duration of such a vibration its effect is propagated to a distance of 300 metres, and in the limited space of a laboratory it would appear simultaneous with the vibration. The known phenomena, therefore, could not assist us, and we were obliged to find another way. What enabled us to circumvent the obstacles is the fact that it is not only the discharge of Leyden jars which produces vibrations, but that the same phenomenon occurs in any conductor whatsoever; under certain conditions these vibrations may even be much more rapid than those of the Leyden jars. On discharging the conductor of an electric machine, vibrations are produced whose duration varies from 100 to one thousand-millionth of a second. These are, it is true, only isolated vibrations dying away rapidly, and we have here an unfavorable condition for the experiment. But success would be possible even by observing only two or three of these vibrations. Thus, in the domain of acoustics, we replace, if required, the long-stretched sound of whistles and of cords by the short signals of wood (resonators). We thus possess signals, in comparison with which the thirty-millionth part of a second is no longer a short interval. But they would be of little use to us if we were not able to discern them at the assumed distance of thirty metres. The means employed for this purpose is very simple. At the spot where we wish to observe the signal we place a conductor—for instance, a straight metallic wire with a short breakage at a given point. When the electric field varies rapidly a spark appears in this conductor. This means of observation could only be indicated by experience; from the theoretical point of view it was difficult to imagine. In fact, the sparks are microscopic, hardly one-hundredth of a millimetre long; their duration is less than one-millionth of a second. It seems impossible—almost inconceivable—that they should be visible, and yet they are so in a dark room and for a steady eye. Such is the slight thread on which hangs the success of our undertaking. We have, in the first instance, a number of questions to solve. Under what conditions are the vibrations strongest? These conditions must be fulfilled. What form ought we to give to the conductor? According as we employ straight or bent wires, or conductors of different shape, the phenomena vary. If the form of conductor is established, what size shall we give it? This is not indifferent, for we soon find that we cannot with one and the same conductor study any vibrations whatsoever; that there exists

a relation between these two factors, which reminds us of the phenomena of resonance in acoustics. Finally, how many different positions can we give to this conductor? At one time we shall see the sparks increase in strength, at another they will become weaker, and finally disappear altogether. I do not wish to enter upon all these details, although they are essential factors for the success of the experiments. On the knowledge which the experimenter has of the means at his command depends the result of his experiments. A thorough acquaintance with the instruments, *i. e.*, the solutions of the above questions, was, therefore, the most important part of my work. When this task was done the solution of the problem followed by itself. Give a physicist a certain number of tuning-forks and resonators, and ask him to prove that the propagation of sound is not instantaneous. He will have no difficulty in doing so, even within the limited area of a room. After having thrown a tuning-fork into vibration, he carries it with the resonator to different parts of the room and observes the intensity of the sound. He finds that at certain places it becomes more feeble, and concludes from this that each vibration is annulled by another which took its rise later and arrived at the same end by a shorter route. If, in order to traverse a shorter route, less time is required, the propagation is not instantaneous, and the problem is solved. But then our physicist will show us that the points of silence succeed each other at equal distances; thence he deduces the length of a wave, and, if he knows the duration of the vibrations of the tuning-fork, he can now determine the speed of transmission of sound. We operate in exactly the same way with our electric vibrations. The conductor in which the electric variations take place plays the part of the tuning-fork. The circuit broken at a given point replaces the resonator, and is actually called electric resonator. We observe that at certain points of the room sparks issue from this latter, that at other points it remains at rest; we find that the inactive points, electrically speaking, follow each other in regular order. From this, we conclude that the propagation is not instantaneous, and can even measure the length of wave. We shall be asked whether the waves we have found are longitudinal or transverse. Let us place our metallic wire in two different positions at the same point of the room; in one position it indicates an electric excitation, in the other it does not. This settles the question. We have to deal with transverse waves. If we are asked to indicate their speed of transmission, all we have to do is to multiply the length of wave which we have just measured by the duration of the vibration which we can calculate. We find a speed very near that of light. If any one should contest the correctness of this calculation, there remains for us another expedient. The speed of propagation of electric waves in metallic wires is enormous, and quite comparable with their speed in the air. Moreover, it has been measured directly a long time ago, for it was easy to study their propagation on wires many kilometres long. We, therefore, possess a purely experimental value of their speed, and, although the result is only approximative, it does not contradict the result we have just obtained. All these experiments are very simple in themselves, and yet their consequences are most important. They completely upset the theory of an instantaneous transmission of electric forces through space; they mark the triumph of Maxwell's system. This latter is no longer a connecting link between two classes of entirely distinct phenomena. If this theory of light formerly seemed probable, it must now be considered as true. But perhaps, in approaching the end, we might do without the support of the theory. Our experiments were made quite close to that neutral zone which, according to the theory, unites the domain of light and that of electricity. This will not be superfluous. There remains only one step to take to arrive at the proper domain of optics which is so well known to us. There are many friends of nature who take an interest in the problem of light, who are able to understand simple experiments, and yet for whom Maxwell's theory is absolutely unintelligible. Moreover, direct routes in scientific methods are always preferable to circuitous ones. If, therefore, by means of electric waves we can succeed in producing phenomena similar to those of light, all theorizing becomes unnecessary; the identity of the two classes of facts will be demonstrated to evidence by the experiments themselves. By this way, true success is possible. Let us place the conductor which produces the variation of the electric condition in the focus of a large concave mirror. The electric waves are collected and issue from the mirror in the form of a rectilineal bundle. We can, it is true, neither see nor touch this bundle, but we know that it exists, because we see sparks passing over from it to any conductor it may meet; it becomes perceptible when we arm ourselves with our electric resonator. All these properties are those of a luminous ray. We can, by turning the mirror, send it in different directions; we can, by studying the path it follows, ascertain that it is propagated in a straight line. If we interpose on its path conducting bodies, they do not allow the electric ray to pass; they carry a shadow, but they do not destroy the ray; they reflect it, and we can follow the reflected bundle, and convince ourselves that it follows the aame laws as the reflection of light. We can refract it as well as a luminous ray, To study the reflection of light we employ a prism; we do the same thing here. Only, the dimensions of the waves and of the ray compel us to take a prism of very large dimensions; we choose, therefore, a very inexpensive substance, pitch or asphalt. Finally, we can study with our ray phenomena which have hitherto been only observed with light, namely, those of polarization. On the path of the bundle let us place a sort of metallic grating; we shall find our electric resonator emit sparks or remain at rest in obedience to the same geometrical laws which govern the variations of brightness of a luminous ray traversing a polarizing apparatus. But we have done with experiments; in making them we have arrived in the very midst of the domain of optics. In describing them we no longer speak of electricity, we employ optical terms. We no longer say that currents traverse conductors, that electricities unite; we only see undulations crossing each other in space, separate, combine, strengthen or weaken each other. Starting from the domain of pure electricity, we have reached step by step purely optical phenomena. The passage has been crossed, the route becomes easy. The identification of light and electricity, suspected by science, foreseen by theory, is definitely established; it has become perceptible to our senses, intelligible to our minds. From the height which we have reached, and where the two classes of phenomena intermingle, our eyes range over the domains of optics and of electricity. They appear to us larger than we imagined. Optics no longer is confined to undulations of the ether of some fractions of a millimetre: it comprises waves whose length is measured by metres, decimetres and kilometres. But, in spite of this enlarged horizon, optics, when seen from this height, is only an appendage of electricity. The latter's gain is still larger. We shall see henceforth electricity in a thousand circumstances where we did not suspect it before; each flame, each luminous atom becomes an electrical phenomenon. Even when a body does not give off any light, provided only it radiates heat, it is the source of electric actions. The domain of electricity thus pervades all nature—it pervades ourselves; in fact, is not the eye an electric organ? Such are the results we obtain in questions of detail; those which concern the philosophy of science are not less important. One of the most arduous problems is that of actions at a distance. Are they real? Of all those which formerly seemed incontestable to us, only one remains—gravitation. Will it likewise slip from our hands? The very laws of its action make me think so. The nature of electricity is one of these great unsolved questions. It may be reduced to the question as to the condition of electric and magnetic forces in space. Behind it rises the most important problem of all—that of the nature and of the properties of the substance which fills space; of the ether, of its structure, its movements, its limits, if any there be. We find this question more and more overawing all the others; it seems that the knowledge of the ether not only ought to reveal to us the condition of the imponderable substance, but also the essence of matter itself, and of its inherent properties, weight and inertia. The ancient systems of physics asserted that all is formed of water and of fire. Modern physics will soon ask itself if all existing things are not modalities of the ether. This is the *Ultima Thule* of our science; these are the ultimate heights we can hope to reach. Shall we ever reach them? Will it be soon? We cannot tell. But we have climbed higher than ever, and we have acquired a firm footing which will facilitate our ascent and our searching for fresh truths. The road which opens up is not too steep, and the next stage does not appear inaccessible. Moreover, numerous is the crowd of seekers full of ardor and of science; and confidently we greet all the endeavors made in this direction!

TRADE-MARKS.

SOME INTERESTING DECISIONS BY THE UNITED STATES COURTS.

A trade-mark consists of a word, mark or device adopted by a manufacturer or vender to distinguish his production from other productions of the same article. 17 F., 620.

The object of a trade-mark is 1st, to protect the party using it from competition with inferior manufacturers; and 2d, to protect the public from imposition. 12 F. 707.

The nature of a trade mark is that it identifies the wares of its owner, in trade, to protect him from inferior competition, and the public from imposition; and anything which can serve to distinguish goods of one man's production from those of another may be used; tokens, letters, signs, names, cyphers, monograms, pictures or numerals in combination.

2 Circ, (N. Y.) 1882. Shaw Stocking Co. *vs.* Mack. 12 Fed. Repr., 707.,

Independent of legislation declaring rights in trade-marks, there is a general doctrine of equity protecting them, which is well understood. Every one is at liberty to affix to a product of his own manufacture any symbol or device not previously appropriated which will distinguish it from articles of the same general nature. manufactured or sold by others, and thus secure to himself the benefit of increased sale by reason of any peculiar excellence he may have given to it. The symbol or device thus becomes a sign to the public of the origin of the goods to which it is attached, and an assurance that they are the genuine article of the original producer; and the courts will protect him in the exclusive use of it.

Supreme Court, 1879, Manufacturing Co. *vs.* Trainer 101 U. S. 51.

The certificate of the registry of a trade-mark under the act of 8th July, 1870, is not conclusive that the device claimed is a *lawful* trade-mark, nor that the claimant is the first appropriator and entitled to its exclusive use. 4 Am. L. T. Rep. 38.

The registration of a trade mark is not conclusive upon the courts that it is in conformity to the law. 6 Am. L. T. Rep. 38.

What may be used as a trade-mark:

Whether a manufacturer has a trade-mark or not, if he was the first to put up his goods for sale in peculiarly shaped and labeled packages adopted by him, and his goods become known to purchasers, and are purchased by them as his manufacture, by reason of the peculiar shape, color and label of the packages, no person has the right to use the same form of package, color or label, or any imitation thereof, in such manner as to deceive purchasers into believing that they are

purchasing the goods of the original manufacturer, no matter whether they are better or worse in quality.

Sawyer *vs.* Horn, § 441.

The use of a label made in imitation or a label in use for a long time upon an article of the same nature, and which is calculated to deceive purchasers, will be enjoined.

Sawyer *vs.* Kellog, § 442.

Ground on which a trade-mark is protected:

Chancery protects trade-marks upon the ground that a party shall not be permitted to sell his own goods as the goods of another; and, therefore, he will not be permitted to use the names, marks letters or other *indicia* of another, by which he may pass off his own goods to purchasers as the manufacture of another. Craft *vs.* Day, 7 Beav., 84; Perry *vs.* Truefitt, 6 Beav., 66; Newman *vs.* Alford, 51 N. Y., 192.

Witnesses in great numbers were called by the complainant, who testified that the exhibits L. and K. of the respondent were calculated to deceive purchasers; and the reasons given by them in support of the conclusion are both persuasive and convincing. Differences between these exhibits and Exhibits F. and H. of the complainant undoubtedly exist; and still it is manifest that the general appearance of the package in the respects mentioned, and others which might be suggested, is well calculated to mislead and deceive the unwary, and all others who purchase the article without opening the case and examining the label.

Caswell *vs.* Davis, 58 N. Y., 223.

What constitutes an infringement of a trade-mark:

Much must depend, in every case, upon the appearance and special character of the entire device; but it is safe to declare, as a general rule, that exact similitude is not required to constitute an infringement or to entitle the complaining party to protection. If the form, marks, contents, words, or the special arrangement of the same, or the general appearance of the alleged infringer's device, is such as would be likely to mislead one in the ordinary course of purchasing the goods, and induce him to suppose that he was purchasing the genuine article, then the similitude is such as entitles the injured party to equitable protection, if he takes seasonable measures to assert his rights, and to prevent their continued invasion.

James *vs.* James, Law Rep., 13 E. 425.
Singleton *vs.* Bolton, 3 Doug., 293.
Morrison *vs.* Salmon, 2 Man & G., 385.
Beardman *vs.* Meriden B. Co., 35 Conn., 413.

Colorable imitation of a trade-mark:

Difficulty frequently arises in determining the question of infringement; but it is clear that exact similarity is not required, as that requirement would always enable the wrong-doer to evade responsibility for his wrongful acts. Colorable imitation, which requires careful inspection to distinguish the spurious trade-mark from the genuine, is sufficient to maintain the issue; but a Court of Equity will not interfere when ordinary attention by the purchaser of the article would enable him at once to discriminate the one from the other. Where the similarity is sufficient to convey a false impression to the public mind, and is of a character to mislead and deceive the ordinary purchaser in the exercise of ordinary care and caution in such matters, it is sufficient to give the injured party a right to redress, if he has been guilty of no laches.

Amoskeag M'f'g Co. *vs*, Spear, 2 Sanff., S. C., 599; Coddington Digest, 109; McAndrew *vs.* Bassett, 4 Deg., J. & S., 380.

Sulphuric Ether Used as a Motor.—M. de Susini, a Corsican doctor, has constructed a motive apparatus or propeller of 20 horse-power, which is worked by sulphuric ether, a result which the doctor anticipates will realize a saving of 65 per cent. of the combustible material at present employed for setting machinery in motion.

BAKING POWDERS.

Report of Three California Chemists.

TABLE SHOWING COMPOSITION OF THE PRICE AND THE ROYAL BAKING POWDERS.

INGREDIENTS.	DR. PRICE'S Prof Rising, Analyst, 889.	DR. PRICE'S Prof. W. D. Johnston, Analyst, 1889.	DR. PRICE'S Dr. Winslow Anderson, Analyst, 1889.	ROYAL Prof. M. Delafontaine, Analyst, 1884.	ROYAL Prof. W. D. Johnston, Analyst, 1889.	ROYAL Dr. Winslow Anderson, Analyst, 1889.
Carbonate of Ammonium $(NH_4)_2 CO_3$	....	....	....	2.25	2.30	3.52
Cream of Tartar. Potassii Bitartras $(KHC_4 H_4 O_6$	50.55	50.26	50.52	50.60	47.30	49.36
Bicarbonate of Soda. Sodii Bi carbonas $(NaHCO_3$	26.16	24.60	25.21	22.90	22.84	22.11
Tartate of Lime. $(CaC_4 H_4 O_6)$	....	....	....	5.25	....	....
Starch and Moisture $C_6 H_{10} O_5+H_2O$	with moisture 23.29	with moisture 25.14	with moisture 24.27	19.00	with moisture 27.56	25.01
Totals	100.00	100.00	100.00	100.00	100.00	100.00
Available amount of leavening gas	....	212°F. cu. in. 140.0	cu. in. 127 93	not given.	not given.	cub. in. old can 106.54 cub. in. new can 126.17
(Carbonic acid gas, CO_2)	11.83%	not given	11.63°/。	not given.	not given.	9.14°/。 old can 11.03°/° new can

The great object for which most baking powder manufacturers strive is the production of carbonic anhydride at the least possible expense. But the public should exact more than this. The baking powder should be so made that it will yield a large amount of leavening gas (CO_2) and a small and *absolutely harmless* residue. Can these indispensable requisites be obtained in any better way or by the use of better materials than those of pure cream of tartar and bicarbonate of soda mixed with some drying substance such as starch? I do not believe it possible; certainly ammonia and alum are poor substitutes.

ITALIAN WINE.

WHY IT IS GENERALLY INFERIOR TO THAT OF FRANCE.

Why is Italian wine inferior to French? and why do Italian vines, from the same vineyards, vary so much in quality from year to year? An Italian winegrower, lately come to England, fresh from one of the worst vintages Italy has experienced for many a year gives us the answer. It is in consequence of the haphazard manner in which the easy-going Italian does his work. Instead of planting his vineyard with one or two kinds of vine, as the Frenchman would do, in proportions that must never vary, he allows, say a dozen different kinds to grow together in one vineyard. Some may bear early and some late grapes, some may have one flavor and some another, but no matter, they must all find their way to the same vat and at the same time, and according to the varying seasons so is the wine. One year there is a preponderance of ripe or early grapes, then the wine is sweet. Another year there are more unripe or late grapes than usual, consequently the wine is sour. Or, the grapes of one flavor are more abundant than those of another—so is the flavor of the wine influenced. Then, again, the French wines, instead of being allowed to grow with their native freedom, as in Italy, are more regularly pruned and tended, so that the grapes may receive the amount of sun and nourishment that is best suited to them. These things all tend to make a standard wine, which, in flavor and sweetness, varies as little as possible from one vintage to another. Nevertheless, wine growers in Italy are showing signs of a desire to improve, *e. g*; we know of an English lady in Tuscany who, dissatisfied with the native mode of growing and making wine on her own estate, spent a considerable time in Burgundy in order to master the science of vine culture in that district, and returning, applied her knowledge to her own vineyards with very considerable success. But until the Italians more generally follow the example of the French, said our informant, and take more care of their vines, they will never be able to compete with French wine.—*Murray's Magazine.*

BATH-ROOM LUXURY.

MODERN TASTE EXCELLING ANCIENT ELEGANCE IN BATH-ROOM APPOINTMENTS.

Time has been within this generation when the bath-room was the least considered room in a house, if, indeed, such a room were not believed to be entirely superfluous. Time has been also, though in a somewhat distant past, when the bath-room was the most sumptuous and elegant apartment in the house. The old Pompeiians and fellows of that time and those tastes used to make bath-rooms and bath-houses and bathing establishments that, uncovered to-day, still reveal the marvellous beauty and luxury of their original appointments. Just at present the matter of bath-room occupies a medium position with a tendency toward the Pompeiian. The bath-room has not yet become the chief or the finest room in any of the beautiful modern houses that architects are designing and millionaires are building in and around this city, but very much money and a deal of artistic skill and scientific wisdom is being lavished upon those apartments in all modern houses, even in those that are built for renting. In the first place, bath-rooms are now built from twice to four times as large as they used to be. Formerly any little closet room would do for the bath-tub. It wasn't even considered necessary to have it large enough to take a tub that would hold a person at full length. Its finishing was plain and its furnishing next to nothing. Now the bath-room must be a room anywhere from six by ten for a small and narrow house to twelve or fifteen feet square for a fine house, and even larger for many of the mansions now being erected. The walls are of tiling, usually, though hard wood and plaster are sometimes used, and the floors are of tile or marble. Stained glass is used in windows wherever possible, and in many cases the ceiling is arranged to open clear to the roof, and there is an ornamental glass roof. The fittings of

a well-furnished bath-room now include, besides the regular tub, a sitz bath-tub, with spray and wave bath attachments, and basins, closets, and other apparatus to suit the taste or convenience of the owner and the amount of room at command. Copper is the cheapest material that is thought of for a fine bath-tub, and frequently hundreds of dollars are expended upon the fabrication of a tub especially to suit the taste of a man or woman with unusually luxurious ideas. Mrs. Langtry, for instance, has a tub of silver. It was made originally for an Indian rajah, and came into Mrs. Langtry's hands after passing through those of numerous people who couldn't imagine that such a magnificent thing could actually be used. It is in this that Mrs. Langtry takes the famous daily cold-water baths over reading about which, all other women shiver sympathetically and say "Oh, my!" Plain copper tubs are often covered with enamel inside, and this may be made of various colors, such as may best suit the complexion of the persons using them. The use of taste in such a matter as this is more frequent among the women of to-day than would be suspected, dealers in bath-room apparatus say. The fact should go far toward settling the question as to whether women like to be beautiful for themselves alone or for others. A great many bath tubs nowadays are made to stand on little short legs instead of being cased in clear to the floor. Raising them up in this way gives a chance for the air to circulate all around them, and leaves no opportunity for leaks or water splashed over the sides to keep the floor or woodwork damp and unhealthy. Such tubs are made of brass, bronze, and other metals and are lavishly decorated. A woman wrote recently to an English paper, protesting against the custom of setting bath-tubs up above the floor instead of sinking them into it with the top of the tub on a level with the floor. She said the present style of tub was difficult and dangerous to get into and out of. The communication made some comment among architects and others in the business, but the woman's ideas failed to find any expert defenders. The general opinion was that a tub with the top even with the floor would be a deal more dangerous, if not more difficult to enter or leave, at least so long as tubs were made of their present dimensions and were not swimming tanks like those of the ancients. In the matter of health there has within a few years been a great improvement in the construction of bath-tubs and other apparatus for the bath-room. This has, however, been merely a keeping pace with the improvement in the sanitary conditions of the plumbing and similar work all over the house. The cost of a really fine bath-room varies from a couple of hundred dollars, or even less where the walls and floors need no fixing, to as many thousands as one chooses to pay. The merely useful with incidental ornamental features cannot well go beyond $500, but when art steps in the limit to the game is wiped out, and one can play as high as his pocket-book will go. Many of the most beautiful works of art both in fresco and oil paintings, in this city are in bath-rooms, and costly statuary in bronze and marble is frequently added to the attractions of the place. Of course, art in such places runs much to the nude and semi-nude. If anybody ever succeeds in making up a loan collection of bath-room art contributed by connoisseurs, there will be a sensation in art circles and Anthony Comstock's office. The business of furnishing bath-rooms has become so important of late years that some firms devote their whole attention to it and have large capital invested in it. They issue regular catalogues of their apparatus, and furnish customers with illustrated suggestions as to the different styles in which a bath-room may be finished off. When the customer makes a selection from the suggestions or gets an architect to get him up orginal designs for the purpose, the firm takes the job of carrying out the plans, and besides furnishing the apparatus and materials has expert workmen to set them up and to do the decorating and finishing of the room.

One final word to persons about to invest in a modern bath-room: Don't fail to save enough money to buy a handsome rug for it. Water won't hurt a fine rug, and it can easily be dried out in a few minutes if it is splashed, while for decorative and comforting effect in a bath-room there is nothing like it. A fine rug is as good as five degrees more heat in a bath-room, just from the warm, rich and comfortable look it gives the place.—*Tribune.*

THE ART OF SWIMMING.

SHOULD IT BE A BRANCH OF PUBLIC SCHOOL EDUCATION?

Some have impeached the administration of the Board of Education on the ground that it offers, practically without cost, instruction in studies which are not essential to the maintenance of an efficient average of natural intelligence, says the London *Lancet*. Accomplishments, it is argued, not without reason, may be purchased by those who value them without the expenditure of public money. No such objection we feel certain, could properly be urged against the incorporation of a fairly extensive system of physical exercise into the ordinary school work. True, in its general application, this assertion is particularly true in its reference to the art of swimming. As a form of gymnastic movement, and an aid to cleanliness, it is alike valuable, especially to the children attending town schools. As our principal safeguard against the risk of drowning it is simply indispensable. It is, further, most easy to learn, and once learned is never forgotten. We have therefore, observed with much satisfaction a growing tendency not only in board schools, but in schools generally, to include the teaching of swimming in the regular course of education. The latest advance in this direction is a very decided one taken by the School Board of Ashton Manor, Birmingham. It consists in a resolution to erect swimming-baths for the benefit of the scholars and the project, it appears, has been approved by the education department. Into the financial ethics of this new departure we need not enter. In many districts, happily, no such extensive reform would be required in order to secure the end in view. Public baths are to be found in many inland towns and might at set times be utilized by the school children. For others educated at the coast no such provision is required. What is in every case necessary is that swimming be recognized in the regular educational course, and taught by competent persons (who might hold some other office besides) to every boy and girl.

TROPICAL LIFE.

SUPERABUNDANT VITALITY OF A COSTA RICA SWAMP.

A writer in *Longman's Magazine* gives the following vivid picture of some of the charms of life in Central America:

Go and live there, inhabit that picturesque adobe dwelling for twenty-four hours, either with or without jungle fever, and your enthusiasm will possibly be considerably modified. The breeze, tepid and languorous, brings little refreshment to the heavy, steaming atmosphere, charged by blazing sunshine in brief alternation with torrents of rain, deadly miasms from the rot-laden lagoon steal like ghosts through the moon-lit night, and every type of winged and creeping abomination that earth produces there teems and swelters in luxuriant virulence. Great hairy tarantula spiders, centipedes a foot long, and scorpions like miniature lobsters had their being in the banana-leaf thatch above me; land crabs burrowed up through the fungus-grown floor to visit my couch; huge toads and venomous reptiles came frankly in at the door. Alligators and enormous serpents infested the lagoon hard by, and might be expected at any moment. I did not see an anaconda while I was there, but a blow from the tail of an alligator struggling with some creature it had captured actually broke away some of the wall of my hut one night. Beastly bats sailed in occasionally, and were found by daylight pendant and pugnacious overhead, while more than once a yell, a scuffle, and a rush proclaimed the disturbed intrusion of some unidentified delegate of the cat tribe. Respiratory air seemed to have acquired a third constituent in addition to its normal oxygen and nitrogen in the stifling clouds of mosquitoes which filled the darkness—and a Central American mosquito is as merciless an organism as any of its accursed kind found outside the arctic circle, which is saying a good deal. Strange things whizzed and buzzed and boomed through the obscurity, dropping with a sharp thud as though shot, or alighting with sticky feet, reluctant of dislodgment, on one's face; all night long there was a rustling and a crackling and a creeping suggestive of unseen invertebrate horrors all around; walls, floor and roof crawled and were horrent with hideous animation. I am a naturalist by instinct and can love and cherish the meanest reptile, but I would not voluntarily of forethought and design choose a hut in a Costa Rican swamp as a shelter for my sick bed during the delirium of intermittent fever.

BRUNETTE OR BLONDE?

WHICH WILL THE AMERICAN GIRL OF THE FUTURE BE?

New York theatre-goers of a generation ago who read that the divine Patti had blondined her black hair will recall the buzz of comment that arose in the town one day late in the sixties when a famous and popular actress returned from Europe, with her dark hair transformed to a golden hue. The practice was new among the stage artists of America then, but it has become common enough since, and, indeed, a very cursory examination of history will show many distinguished precedents to justify the diva's course. Marie Stuart, we know, gave an auburn tinge to her dark tresses; the bad but beautiful Messalina covered her black locks with a yellow wig, and Mary Antoinette made the fortune of a French artist who discovered a powder that would give her hair the reddish hue characteristic of the women whom the old masters painted. And, indeed, women in all times and places, where fashion has demanded it have made use of artificial means to lighten the color of their hair. But the fact that Patti should determine to become a blonde is interesting, not alone because most of the great sopranos, like Nilsson and Jennie Lind, have been blondes, but also because her action is likely to renew the recent discussions regarding the relative popularity of the blonde and brunette styles of beauty in women. Only a few years ago we were deluged with statistics about personal beauty, gathered and interpreted by anthropologists and men who make the physiological changes of the race a matter of study. Dr. Beddoe, of the British Royal Infirmary, furnished the most elaborate collection of figures, and after examining the hair of nearly a thousand young women who came before his notice, announced that the brunette was preferred over the blonde, in conjugal selection, by a ratio of four to three. From such premises the conclusion was obvious that the blonde was doomed to pass eventually out of existence in England. It has also been demonstrated by various anthropological magazinists that blondes are growing noticeably rarer in America. One writer, in fact, has recently declared that they have almost disappeared from New England, and the prediction is freely ventured that as a result of the cosmopolitan mixing of races in this country the American girl of the future will be a brown-haired, dark-eyed creature, smaller as a type than the girl of to-day, but plumper and less angular. These evidences of the passing of the blonde may seem to be confirmed by a hasty examination of existing facts. The women one sees on Broadway, for example, or in the restaurants and theatres of New York and Boston are in the main

brunettes, and a blonde is conspicuous, usually, by her presence. And while New England, as has been said, is almost destitute of blondes, the most celebrated pretty women in Old England to-day—Lady Collin Campbell, the Countess of Dudley, Mrs. Langtry and the somewhat notorious Mrs. Gordon-Baillie, have dark hair and dark eyes. So, also, have Lady Randolph Churchill, (*nee* Miss Jerome), and Mrs. Hughes-Hallett, who was the beautiful Emily Schaumberg, of Philadelphia. The reigning beauty of Berlin is a dark-haired woman, and so is the Empress Elizabeth, who was in her youth the most beautiful woman in Austria. The belle of New York a season ago—Miss Sallie Hargous—is a pronounced brunette. In further support of Dr. Beddoe's theory, the names of other women famous for their brunette style of beauty will readily occur to the reader. But if the facts presented by him are to be relied on implicitly, if such a change as he predicates is really taking place, it is indicative of a most radical alteration of the standard of beauty that has prevailed among the Aryan race since its first appearance in history. It indicates that the swarthy races of Southern Europe, conquered as they were by the fair-haired and rosy-checked emigrants of the plains of Asia, have by peaceful intermarriage overcome in turn their former conquerors. It is possible to make an extended catalogue of noted English and American women whose personal charms have been of the blonde type. Harriet Lane, whose reign at the White House in James Buchanan's days is still a social milestone, was a blonde with "golden hair, deep violet eyes and a peculiarly beautiful mouth." Kate Chase, the belle of Lincoln's Administration, had auburn hair. Harriet Williams, the Georgetown beauty, who married Count de Bodisco, the Russian Minister at Washington, and became the belle of St. Petersburg, was a "magnificent fair woman with golden hair and brown eyes." Saidee Polk Fall, the belle of Nashville, has reddish-golden hair. Beautiful Consuelo Yzanaga, now Lady Mandeville, has brown eyes and black eyebrows, but her hair is a mass of gold. Miss Mabel Wright, perhaps the prettiest girl in New York society, has been called "the most exquisite blonde ever seen on this side of the Atlantic," and Mrs. Adolph Landenberg, the married belle, has a pink complexion, blue eyes and curling hair, that "is like spun gold." Amelie Rives has straw-colored hair, which she ties in a Psyche knot; and violet eyes. Mlle. Reichemberg, Gen. Boulanger's favorite, is a pretty woman of the blonde peasant type. Marie Bashkirtseff, the fair Russian artist, about whom the world is talking, was a slendor and delicate pink-cheeked blonde. Many of the ladies of the Administration circles in Washington, including Mrs. Morton, Mrs. McKee and Miss Mildred Fuller, are blondes, and the list might be extended indefinitely. If the blonde is going out of existence she is, from all indications, going out in a blaze of glory.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

January.

MEAT.—Beef, mutton, pork, veal.

POULTRY AND GAME.—Chicken, duck, turkey, geese, rabbit, hare, partridge, pheasant, wild fowl, pigeons.

FISH.—Brill, carp, cod, eels, salmon, whiting, haddock, oysters, lobsters, smelt.

VEGETABLES.—Brocoli, beet, cabbage, carrots, celery, onions, parsnips, turnips.

FRUITS.—Apples, pears, oranges, bananas, lemons, nuts.

PRACTICAL RECIPES.

FRENCH SOUP.—Put together in a soup kettle about six pounds of beef, one pound of veal bones, a piece of calf's liver, and a couple of chickens' heads; cover with four quarts of cold water, and let it boil up a few minutes. Skim, and add a couple of turnips, two or three leeks, a head of celery, a burnt onion, a carrot, salt; simmer for seven hours, removing the scum carefully as it rises. Serve with bits of fried or toasted bread.

FRESH MACKEREL, WITH PARSLEY SAUCE.—Split a mackerel; cleanse and skin it; take out the bones and cut it in half; salt and pepper the pieces; fold them together and place them on a buttered pan; cover with a buttered paper and cook for ten or fifteen minutes; dish the fillets, and in the pan put a tablespoonful of butter rolled in flour, the juice of a lemon, a teaspoonful of chopped parsley and a little grated nutmeg; let it boil up once; pour over the fish, and serve.

CARROT CHOPS.—Mash finely some boiled carrots, with butter, pepper and salt; add a beaten egg, and mix well; shape with the hands like a chop; dip in egg and bread crumbs and fry brown in butter; serve with gravy or melted butter.

VEGETABLE SALAD.—Slice five large cold boiled potatoes and two large red beets and put them in a salad bowl; add the heart of a head of lettuce, two sliced raw tomatoes, one sliced hard boiled egg, and half a head of celery cut in small pieces; over this pour a dressing made as follows: Put a quarter of a teaspoonful of mustard in a bowl, and on it pour three tablespoonfuls of vinegar; when the mustard is dissolved, add two tablespoonfuls of olive oil; pepper and salt; mix lightly and put on vegetables.

APPLE CUSTARD PIE.—Take a pint of stewed apples, and with them mix four ounces of butter, half a pound of powdered sugar, a little powdered cinnamon, and the yolks of six eggs, well beaten. Line a pie plate with puff paste; fill with the mixture; bake; serve cold with cream.

SUGAR COOKIES.—One egg well beaten in a teacup three tablespoonfuls of water, six tablespoonfuls of melted lard; put this in the cup with the egg; fill up with sugar (granulated is best), one teaspoonful of Horsford's baking powder; mix stiff and roll thin.

BAKED PARSNIPS.—Having washed and scraped your parsnips, cut them into pieces and cook them in as little water as possible. Let them get quite tender, being careful that there is just enough water always on them to keep them quite wet. When done, put them into a pan; pour over them the water left from boiling them, and brown in a hot oven, basting often.

PROVERBS ABOUT SNOW.

A SELECTION OF SAYINGS WHICH SEEM TO HAVE A FOUNDATION IN FACT.

There are many proverbs about snow. Some have relation to signs by which the number of storms during the season are to be calculated and others to the number of storms in the following winter, while still others claim a connection between the moon and the snow. Passing by these, it may be interesting at the beginning of the snow season to have a selection of the proverbs which seem to have a foundation in fact.

Snow is generally preceded by a general animation of man and beast, which continues until after the snowfall ends. When the first snow remains on the ground some time in places not exposed to the sun expect a hard winter.

It takes three cloudy days to bring a heavy snow.

If the snow flakes increase in size a thaw will follow.

If there is no snow before January there will be the more snow in March and April.

The more snow the more healthy the season.

Heavy snow in winter favors the crops of the following summer.

A snow year, a rich year.

Snow is a poor man's fertilizer, and good crops will follow a winter of heavy snowfall.

If much snow be spread on the mountain in winter the season of planting will be made blue with verdure.

A heavy fall of snow indicates a good year for crops, and a light fall the reverse.

Much sleet in winter will be followwd by a good fruit year.—*Boston Journal.*

BOHEMIA LOQUENS.

Preserve me from Delmonico!
 A Sevres plate, a speck of salmon,
Three knives, five forks laid in a row—
 A service rich enough for Mammon;
A napkin three feet square or so.
 A snack of roast, a haughty waiter,
A tiny glass of Veuve Cliquot—
 Cut glass—with song and laughter later;
And then, while famine stricken still,
 The waiter with a visage solemn
Obtrusively presents your bill—
 A fat and formidable column.
Quenched is your mirth and o'er you steals
 A mordid fit of melancholy;
A careful man could buy ten meals
 With what you've paid for one! What folly!

Give me instead my mug of Weyand's,
 Two Wieners mustard-coated rare!
Away with all your dainty viands!
 Give me the homely German fare.

I love the cold potato salad,
 I love my corner by the fire,
I love the robust German ballad,
 That kindles fresh the heart's desire;
I love the jolly crowd of smokers,
 I love the salamander's roll,
I love the tapster and the jokers,
 I love the very modest toll.

For when the final mug I've quaffed,
 When one by one the guests are going,
When I my very last have laughed,
 And I inquire what I'm owing,
How sweet it is to hear mine host—
 I never saw a man immenser—
When he has reckoned up the cost,
 Say, "You owe me twenty-seven cents, sir"
—*Buffalo Courier.*

A CONTEMPTIBLE FRAUD.

A MILK CONTRACTOR ARRESTED FOR FURNISHING CONDENSED SKIMMED MILK.

Chemist Martin submitted to the Board of Health a report upon a series of analyses of the condensed milk sold by Henry Y. Canfield, milkman of No. 411 Seventh avenue. Canfield is the contractor who supplies the department of Charities and Correction and all the hospitals and institutions on East river islands. He sells to the city, it is said, 300,000 quarts of condensed milk a year. He also supplies condensed milk to the health department hospital. The report of the chemist sets forth that while his contract with the city requires that the condensed milk shall contain 14 per cent. of fat, the analyses show that it contains no more than from 10 to 8½ per cent., or a third less than the standard. The assumption is that skimmed milk has been used in its manufacture. Upon this showing Mr. Canfield was arrested by a sanitary policeman. He had been previously arrested for selling adulterated milk. Chemist Martin recommends that the board advise the Charity Commissioners of the state of affairs. A chemist is attached to that department, too, who by the reports will be convicted of neglect of duty. It is expected that there will be trouble when the report reaches Eleventh street.—*N. Y. Commercial Advertiser.*

If the chemical tests employed by the chemist of the N. Y. Board of Health have been changed, so that their correctness cannot be disproved, as was the case not long ago, Mr. Canfield will possibly be convicted.

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CONTENTS.

GENUINE FOOD REFORM.

In our issue of December 12, 1889, we gave a brief announcement of the organization in Cleveland, Ohio, November 27, of the "National Dairy and Food Commissioners' Association of the United States." The object of the new organization is "to establish a uniform standard for the purity of human food and drink, and to encourage the honest manufacturer and protect the consumer." Through the courtesy of Hon. F. A Derthick, secretary of the association, we are enabled to place before the readers of the AMERICAN ANALYST, in this issue, the full text of the bill that is to be submitted to Congress this winter under the auspices of the new organization. In its main features it will be found to be practically the same as previous documents of a similar character, its resemblance to the Washington bill of 1887 being particularly apparent. But there seem to be some collateral qualities attaching to this latest movement which its predecessors did not possess, and which inspire a confidence as to its intention, at least, that never was associated with those false and futile manifestations. To state the point briefly, this Cleveland bill bears throughout the stamp of honest purpose. It was not concocted by charlatans as a side issue for securing newspaper subscriptions, nor was it manipulated into shape by tricksters acting in the interest of unscrupulous dealers in adulterated wares. The public has been so often gulled by the devices of pretended champions of pure food that it has learned to look doubtingly upon all public demonstrations in the direction of food reform, experience having shown them to be designed to prevent the very reforms they claimed to foster. In the Cleveland organization the membership is restricted to persons connected with State Dairy or Food Commissions, members of the National or State Boards of Health, and persons specifically appointed by the Governors of States. Manufacturers and merchants, "crusaders" and retail grocers are not accorded the prominent footing that they have hitherto constructed for themselves in so-called "pure food" organizations, and their self-seeking manœuvres will not be permitted, as in the past, to thwart the movement and betray its honest supporters. There is one clause in the proposed bill that has not been embodied in any of those heretofore published, and that is entitled to special consideration. It is in the seventh subdivision of section 9, providing that all mixed foods or compounds shall be distinctly labelled with the name and per cent. of each ingredient they contain. That feature of the proposed law is the keynote of the whole present movement. Its enforcement would throw the responsibility directly on the consumer, and would remove all possible charge of fraud or deception from both manufacturer and dealer. We have long advocated the adoption of such a measure, and we hail with pleasure the prospect of the desirable reform being effected through the passage of the Cleveland bill.

THE NEW VINEGAR LAW.

On the first day of this year the sale in this State of bogus vinegar as cider vinegar became a punishable offence, the law having been passed by the last Legislature at the instance of reputable vinegar dealers who had suffered from competition with men who sold doctored acids as genuine vinegar. The new law forbids the manufacture, keeping or sale of vinegar which shall not have acidity equal to the presence of at least 4½ per cent. by weight of absolute acetic acid, or any cider vinegar which shall have less than 10 per cent. by weight of cider vinegar solid upon full evaporation over boiling water. It is unlawful to offer for sale as cider vinegar any product which is not such, or to use in the manufacture of any vinegar, lead, copper, sulphuric acid or other ingredients injurious to health. Every manufacturer must brand his packages with his name and address. Fines varying from $50 to $250 may be imposed for violation of the new law. A vinegar law, passed in 1887, could not be enforced on account of a lack of funds for prosecution. The State Dairy Commissioner has been given $5,000 to enforce the new law and the vinegar inspectors will pair off with the milk inspectors and act as witnesses for one another.

MORE MURDEROUS SCIENCE.

In another column will be found the story of the heartless treatment a young woman recently underwent at the hands of some so-called "Christian Scientists," in Boston, which resulted in her cruel death. In Brooklyn a temporary stop has been put to this peculiar phase of fanaticism by the incarceration of several of its homicidal adepts in the penitentiary. No more flagrant case, however, has been brought to the public attention than this one in Boston, and it is to be hoped, in the interest of reason and humanity, that the authorities in that centre of culture will interpose their authority so as to, at least, prevent the likelihood of a repetition there of such an enormity. A young lady from Chattanooga, Tenn., suffering from consumption, was induced to place herself in the charge of an aunt, who is an enthusiastic disciple of the "Christian Science" faith, as expounded at the Eddy College in Boston. The so-called doctors told her that "nothing was really the matter with her; that her malady was chiefly imagination, and that prayer and faith in God were sure panaceas." She bore up heroically and followed the treatment to the letter. She helped in the work around the house, did part of the cooking, and got out of bed at daybreak, all because her doctor so recommended. The unhappy invalid used often to ask for something to eat between meals, but this was strictly forbidden. At lunch she frequently asked for a bit of meat or fowl, but this was also strictly forbidden. Towards the end she failed rapidly and often said: "In belief I'm dying. In belief I have the most dreadful pains." The day before the doomed girl died she prepared her own breakfast. Her aunt was away all the afternoon, and she slept alone that night. Surely, some person should be held responsible for the manner of that girl's death.

TREE CULTURE IN THE SOUTH.

An extensive attempt is to be made in the cultivation of pines and firs in North Carolina. Messrs. Douglass & Sons, of Waukegan, Ill., have recently signed a contract with George Vanderbilt of this city to plant 1,000 acres to trees on his magnificent estate near Ashville, in North Carolina. For the present, only three hundred acres are to be planted, but a couple of years are to be consumed in this work. Twelve hundred trees are to be planted to the acre, the planters agreeing to cultivate them during two years, and to deliver at the end of that time not less than 1,100 trees to the acre. White pines are to be planted principally, with 4 per cent. of fir, as an experiment, and a few deciduous trees will be mixed through the conifers. Plants from twelve to eighteen inches high will be used. Mr. Douglass, the contractor, proposes to plant fifty or one hundred acres this autumn for the purpose of testing the possibility of late autumn planting. Mr. Vanderbilt's experiment is an important one, and will be watched with interest. It

is, without doubt, the first attempt at tree planting on so large a scale which has been made in the Southern States.

OILING THE WAVES.

The great value of oil upon troubled waters has again been forcibly illustrated in the case of the steamship Croma, from Dundee, which arrived at this city January 3d. Soon after leaving Scotland, the Croma ran into a hurricane of the wildest and most furious sort. According to the statement of her captain, the wind blew at a velocity of more than eighty miles an hour, and the seas were terrible in their tremendous force and fury. The vessel was fast becoming unmanageable, when oil bags were placed at the bow and sides and oil was also discharged through the waste pipes. This moderated the roughness and violence of the waves sufficiently to allow the ship to live through the storm, otherwise she would have gone to the bottom. As it was, her voyage to this port was an unusually long and trying one; but she arrived safe, though somewhat battered. Her captain will doubtless see to it that she carries an abundant supply of oil on all her future voyages.

TRADE-MARKS.

SOME INTERESTING DECISIONS BY THE UNITED STATES COURTS.

(*Continued.*)

1. No trader can adopt a trade-mark so resembling that of another trader as that ordinary purchasers, buying with ordinary caution, are likely to be misled.

2. One cannot have such a right in his own name, as against another person of the same name, unless such other person uses a form of stamp or label so like that used by the complaining party as to represent that the goods of the former are of the latter's manufacture.

3. Exact similitude is not required to constitute an infringement, nor to entitle the complaining party to protection.

4. An injunction will not be refused on account of delay in seeking relief where the proof of infringement is clear, even although the delay may be such as to preclude the party from any right to an account for past profits.

5. Positive proof of fraudulent intent is not required to give a right to an injunction where the proof of infringement is clear, nor is it necessary that a specific trade-mark should be infringed; it is sufficient that there was an intent by defendant to palm off his goods as those of complainant.

McLean *vs.* Fleming, 96 U. S. Sup. Ct. Rep., 245.

The basis of the action of a court of equity to restrain the infringement of a right to a trade-mark is fraud on the part of the defendant. 7 Bl. C. C., 112.

Injunction granted to restrain the use of the words "Coral Baking Powder," on the ground that such label, though not in itself an infringement of the trade-mark, Royal Baking Powder, was adopted, taken in connection with the color of the labels and appearance of the cans used to deceive the public.

Circuit Court (Mich.), 1885, Royal Baking Powder Co. *vs.* Davis, 26 Fed. Repr., 293.

The imitation of a trade-mark of another, to be unlawful, need not be, in all particulars, exact and complete; it is sufficient if it be of a nature to mislead and deceive. 1 Dill, 329.

If the mark used by the defendants bear such a resemblance to the plaintiffs' trade-mark, though not an exact copy, as is calculated to mislead the public generally, who are purchasers of the article and to make it pass with them for the one sold by him, it is an infringement. 4 McL., 516.

The complainant in a trade-mark suit is entitled to relief if the marks or brands used by the defendant sufficiently resemble the plaintiffs' marks or brands to be mistaken for them. 25 F., 125.

To entitle the plaintiff to relief against an illegal appropriation, it is not necessary that the imitation should be so close as to deceive persons seeing the two marks side by side; it is sufficient if there is such a degree of resemblance that ordinary purchasers, using ordinary caution, are likely to be deceived. 22 F., 823.

Whether a defendant has colorably imitated a trade-mark consisting of a word is not to be determined merely by considering the resemblance between the words themselves; and if defendant has dressed his word in such accessories that it may be mistaken for complainant's word, that circumstance is to be considered.

Glen Cove Manufacturing Co. *vs.* Ludeling 22 F., 823.

Similitude.—It is enough that such similitude exists as would lead an ordinary purchaser to suppose that he was buying the genuine article and not the imitation; and it is not necessary that the resemblance should be such as would mislead an expert, or such as would not be easily detected if the original and spurious were seen together.

Shaw Stocking Co. *vs.* Mack, 12 F., 707.

Violation by Imitation.—The use of another name, such as "Reeve's Improved," in place of "Humphreys'" before the words "homeopathic specifics," does not take the defendant out of the class of imitators; such prefix does not meet the difficulty, as the remedies are purchased by the public by the numbers alone, and the defendant has made use of such numbers.

Humphreys' Specific H. M. Co. *vs.* Wenz., 14 F., 250.

Intention to Deceive.—There may be an infringement without a specific intent to deceive the public. If the effect of the device, when considered alone or in connection with the shape, size, character and appearance of the article upon which it is placed is to deceive, the party adopting it is to be held to have intended deception, as every man is held to have intended the necessary, natural and probable consequences of his own acts.

Liggett & Myer Tobacco Co. *vs.* Hynes, 20 F., 883.

Similarity.—In a case where it is claimed that a trade-mark has been infringed, to constitute an infringement it is not necessary that the device complained of should be a *fac-simile* of the device of complainants. There may be an infringement without exact similarity.

Liggett & Myer Tobacco Co. *vs.* Hynes, 20 F., 883.

It is not needful, in order to constitute an enjoinable infringement, that the trade-mark of the complainant should be copied exactly or completely, or that the false mark should be a *fac-simile* of the genuine, or that the resemblance between them should be close enough to deceive experts, or that all the various labels of complainants should have been used. If the resemblance is such that the general public will probably be deceived and misled into buying the defendant's goods in the expectation and belief of obtaining the complainant's, an injunction may be granted, the complainant's ownership of the mark being established.

1st Circ. (Mass.), 1844, Taylor *vs.* Carpenter, 3 Story, 458; 7 L. Repr., 437; 2 West L. J., 187; 2d Circ. (N. Y.), 1856, Walton *vs.* Crowley, 3 Blatchf., 440; 1882, Shaw Stocking Co. *vs.* Mack, 12 Fed. Repr., 707; 28 Int. Rev. Rec., 320; 1884, Atlantic Milling Co. *vs.* Robinson, 20 Fed. Repr., 217; 3d Circ. (N. J.), 1879, Consolidated Fruit Jar Co. *vs.* Thomas, 2 N. J. L. J., 272; 1882, Humphreys' Specific Medicine Co. *vs.* Wenz, 14 Fed. Repr., 250; 15 Repr., 70; 4th Circ. (Md.), 1883, Lorillard *vs.* Wright, 15 Fed. Repr., 383; 1884, Liggett Tobacco Co. *vs.* Hynes, 20 Fed. Rep., 883.

ADULTERATIONS IN MINNESOTA.

AN EVIL DEMANDING LEGISLATIVE INTERFERENCE TO CORRECT.

Professor Charles W. Drew, chemist to the Minnesota State Dairy Commission, has issued an interesting report on adulterations of food in the city of Minneapolis, from which we make the following extracts:

In general, the adulterations to which foods are subjected may be divided into those which are positively injurious to health, such as the addition of poisonous coloring matters to confectionery; those which are simply fraudulent, in that they decrease the commercial value of the article, such as the addition of flour to mustard; and those which may properly be considered as accidental, such as the presence of small amounts of sand in tea or ground pepper. To the dealer in alimentary substances the significance of their sophistication is frequently merely a matter of profit and loss. In a majority of cases these persons are aware of the character of the goods which they sell. No dealer would really expect to purchase pure ground spices put up in quarter-pound packages and neatly labelled *absolutely pure*, for half or three-fourths the price at which the unground spice can be obtained at wholesale, and yet that is exactly what they pretend to do. In justification of such a course, the plea is advanced that close competition and the presence of similar goods in the stores of their rivals compel them to handle them in self-defense. This is in effect the excuse that one cannot afford to be honest since his neighbor is not so, and is surely a justification of the view that those who are inherently honest and desire to remain so should be protected, and those who prefer to practice fraud and dishonesty should at least be forced to acknowledge the fact by selling adulterated goods for what they really are and not as pure and of good quality. Speaking of baking powders, Prof. Drew says: There are three principal varieties of baking powders found upon the market. All of them are mixtures of bicarbonate of soda with some acidifying agent, which serves when the powder is moistened with water to liberate the carbonic acid gas which produces the light, spongy character of the dough. All are diluted to some extent with flour or starch, which serves as a dry filling and prevents the agents from acting upon each other in the package. The first-class contain acid calcium phosphate as an acidifying agent, and are the so-called "phosphate" powders. The second-class contain cream of tartar, and are generally known as "cream tartar" powders. The third class contain ammonia alum, and constitute the "alum" powders. There is a prevalent

belief created by the erroneous statements of manufacturers, that the salts from which carbonic acid is generated pass off in the form of escaping gases, scarcely leaving a trace of their presence in the bread. This is not true in the case of any baking powder whatever. The resultant salts formed by the chemical action which takes place in the dough remain in the bread, and nothing other than the gaseous products escape during baking. Such being the case, no baking powder should be given a place in any household unless it is an established fact that the products of its decomposition which remain in the loaf are of such a character as to admit of continuous ingestion without liability of producing interference with health. As to the general healthfulness of cream of tartar and phosphate powders when properly made and used, there is but little difference of opinion among those who are qualified to judge. The addition of small quantities of carbonate of ammonia to certain of the cream tartar powders is generally considered to be without harmful effect, although I am inclined to regard it as a needless and possibly harmful ingredient, since I have examined samples of cake raised with such powders which, after baking, possessed the odor of ammonia gas strongly.

Of ground spices, Prof. Drew says: The adulterants of ground spices embrace nearly everything which could be imagined as capable of employment for such a purpose. Some of the principal are flours or starches from cereals or potatoes, sago, mustard husks, linseed meal, capsicum, pepper dust, sawdust, gypsum, ground crackers, ship bread, olive stones, cocoa-nut shells, clove stems, charcoal, turmeric, venetian red, various barks, etc. These adulterants are generally prepared upon a large scale and furnished to the smaller spice millers under the title of "P. D.," pepper dust; "H. P. D.," hot pepper dust; "W. P. D.," white pepper dust; "P. D.," cloves; "P. D.," cinnamon, etc., and by them employed to adulterate the ground spices to such an extent as is commensurate with the price which the dealer is willing to pay for his goods, the purity being strictly regulated by the price paid. The only ones imposed upon by this system are the consumers, who are cheated in the value and quality, and often in the weight as well, of whatever they buy.

Speaking of candies, he says: There were 22 samples of yellow candies. Of these, 8 owed their color to the presence of the violently poisonous chrome yellow, while 14 were colored with a coal-tar color called fluorescine, which is stated to be non-poisonous. Twenty-four of the samples were pink, of which 5 were colored with carmine, a harmless agent derived from cochineal, 9 with coralline and 10 with fuchsine. Both of the latter are coal-tar colors and are considered to be injurious in themselves, and to sometimes be positively dangerous from the arsenic which they may contain as an impurity. Thirteen of the samples were red, 7 were colored with cochineal, 1 with fuchsine, and 5 with the poisonous coal-tar color eosine. Since there is so little known relative to the action which these coal-tar colors have upon the economy, and since so many are believed to be poisonous, their use for imparting color to any substance which is to be used for food or drink should be absolutely prohibited. Twenty samples of colored sugars were examined. Five red samples were colored with carmine, and were harmless. Of the remaining 15 the pinks contain aniline reds, the yellows chrome yellow, the blues Prussian blue or indigo, and the greens Brunswick green (a mixture of chrome yellow and Prussian blue). None of these should be permitted to be used, since all are unquestionably injurious.

The conclusions are thus summed up: These investigations and details of sophistication might be carried much further, were it considered necessary. As they are, they disclose an amount of adulteration of foods which is alarming in extent to all save those who profit by their own dishonesty. The counterfeit is palmed off on the innocent and unsuspecting consumer for the real, and he is absolutely without either protection or recourse. The repression of such gigantic frauds upon the people of the State should demand deliberate and careful consideration from all public-spirited individuals, and should call for appropriate legislation upon the part of those who are vested with the power to enact proper and efficient restrictive measures and to provide for their enforcement.

LA GRIPPE.

PECULIAR CHARACTERISTICS OF THE EPIDEMIC IN EUROPE.

We quote from the *British Druggist* the following description of the influenza epidemic as it manifested itself on the other side of the Atlantic before reaching this country. It would appear to be in most respects identical with the imported article with which we are so painfully familiar.

We have not had any real epidemic of this form of catarrh for about forty years, and then it was sufficiently serious in character to require a Parliamentary inquiry and a Blue Book. Previous to that there were several remarkable epidemics—notably that of 1782—which is said to have prostrated four-fifths of the inhabitants of London. Since that time we have made some progress in medical science, and, doubtless, on this occasion physiologists and therapeutists may be able to arrive at a satisfactory conclusion regarding the cause of influenza; and when we obtain precise information on that point, rational treatment will not be difficult to formulate. Hitherto we have sought for the cause of influenza in some peculiar condition of the atmosphere. If the eruption at Krakatoa were not half forgotten by this time, it might have been safe to attribute the present epidemic to it. Were the world closer than usual to some comet or other, we might have thrown the blame in that direction; or we could even attribute it to the air being supercharged with electricity. But none of these explanations will satisfy modern requirements; nothing less, or larger, than a bacillus will do, and for that Continental physicians are already on the hunt. When they get it they will be able to confirm the hypothesis enunciated forty or fifty years ago, to the effect that, "in certain conditions of the atmosphere there are developed myriads of extremely minute substances possessing life, either animal or vegetable. These float about and are driven by currents of air hither and thither. So driven, they are brought in contact with the mucous surfaces of the air-passages, upon which they exercise an injurious influence." It would seem from past records that the atmospheric condition referred to is one of suddenly increased temperature. Thus, in 1782, the thermometer rose 30 deg. in one night in St. Petersburg, and next morning 40,000 people were laid low with influenza. Within the past ten days we have experienced an equally sudden wave of warm weather. Influenza is distinctly febrile in its nature, and is accompanied by inflammatory symptoms of the air passages, great depression, languor, anxiety, and lowness of spirits. There are various complications, and if the attack is severe it is very hard upon old and weakly people, especially if the bronchial trouble is acute. In such cases there is a sudden and unaccountable loss of strength, which is liable to carry off the sufferer. It is this loss of strength which makes two days of the acute symptoms of influenza as bad as a fortnight of some other febrile and bronchial affections, and herein lies the danger, for patients are apt to under-estimate the complaint, and the sudden exposure brings on other chest troubles. Whenever influenza attacks any one he should take to bed without delay, and begin to take diaphoretics at once. For an adult a powder composed of Dover's powder 10 grains, lobelia 3 grains, and nitre 4 grains, is a good thing to start with; so also is a 1-20 grain pilocarpine tabloid. Either of these starts diaphorosis, which must be maintained by hourly doses, consisting of one minim of tincture of aconite in a teaspoonful of Mindererus spirit. Meanwhile the strength should be maintained by nourishing food, preferably in liquid form, such as soups and beef-tea. Diarrhœa is a common symptom, and should be treated with small doses of opium and astringents. When the febrile symptoms have abated, the administration of nourishing food should be continued during the period of convalescence, which lasts ten days or a fortnight, the patient meanwhile taking a tonic of the Easton's sirup class. Amongst the secondary symptoms of influenza are frontal headache, cough, and sore throat, which may be treated with the usual remedies. The complaint is sometimes spoken of as one of inferior gravity, like a common cold, but the symptoms are distinctly different; it is contagious, intensely weakening, occasionally fatal, and for these reasons it is not a thing to treat lightly.

FECUNDITY.—According to naturalists, a scorpion will produce 65 young, a common fly will lay 144 eggs, a leech 150 and a spider 170. A hydrachna produces 600 eggs and a frog 1,100. A female moth will produce 1,100 eggs and a tortoise 1,000. A gall insect has laid 50,000 eggs, a shrimp 6,000, and 10,000 have been found in the ovary of an ascaris. One naturalist found over 12,000 eggs in a lobster and another over 21,000. An insect very similar to an ant (*Mutilla*) has produced 80,000 eggs in a single day, and Leuwenhœck seems to compute 4,000,000 as the crab's share. Many fishes produce an incredible number of eggs. More than 36,000 have been counted in a herring, 38,000 in a smelt, 1,000,000 in a sole, 1,130,000 in a roach, 3,000,000 in a sturgeon, 342,000 in a carp, 383,000 in a tench, 546,000 in a mackerel, 992,000 in a perch, and 1,357,000 in a flounder. But of all the fishes hitherto discovered, the cod seems to be the most prolific. One naturalist computes that this fish produces more than 3,686,000 eggs, and another as many as 9,444,000. A rough calculation has shown that, were 1 per cent. of the eggs of the salmon to result in full-grown fish, and were they and their progeny to continue to increase in the same ratio, they would in about sixty years amount in bulk to many times the size of the earth. Nor is the salmon the most prolific of species. In a yellow perch weighing 3½ ounces have been counted 9,943 eggs, and in a smelt, ten inches and a half in length, 25,141. An interesting experiment was made in Sweden in 1761, by Charles F. Lund. He obtained from 50 female breams 3,100,000 young, from 100 female perch 3,215,000 young, and from 100 female mullets 4,000,000 young.

ARSENIC IN GLYCERINE.—Some months ago we noted a report, taken from one of our German exchanges, that arsenic had been detected in certain specimens of glycerine sold as chemically pure, and at the same time mentioned a similar statement made on the authority of an American or English observer. The reports have recently been confirmed, and further investigation has demonstrated that the poison is present in a greater portion of the pure glycerine manufactured in Germany, to such an extent, indeed, that the necessity for the insertion of an arsenic test for glycerine in the pharmacopœias is obvious. Dr. Vulpius has already proposed its introduction into the German Pharmacopœia, and suggests one which requires that paper moistened with 50 per cent. solution of silver nitrate, when exposed to the hydrogen gas evolved upon adding zinc to a mixture of two cubic centimeters of glycerine with three cubic centimeters of officinal hydrochloric acid, should not within fifteen minutes show any yellow spots, becoming black upon being moistened with water.—*Exchange.*

SUN-DIALS.—Charles Lamb was positively not far wrong, says *The Horological Journal*, when he conjectured that Adam had a sun-dial in Paradise. Dials are probably older even than alchemy. The Babylonians had them; though the Egyptians, that wondrous people who knew most of the things the moderns have rediscovered, seemed not to have used them. The Babylonians gave them to the Greeks; the Greeks, to the Romans; and the Emperor Trajan is credited with an epigram upon the art of dialing. Naturally dials are most frequent in lands where the sun shines, as a matter of course, and not as a rare complacence. French and Italian gardens are full of them. To the walls of sunny chateaux they are fixed in hundreds. In the old days, when there was time for sentiment, and room for it, sun-dials were favorite gifts from great personages to one another,—from people to princes and from princes to people. Cosmo de' Medici, whose fitful humors so angered Benvenuto Cellini, gave one to the Florentine students of astronomy; and on the wall of Sta. Maria Novella it still marks the time of day. But even in our own cold land of fibre and complexion there are dials not a few. In Mrs. Gatty's book some eight hundred inscriptions are set down; and as some favorite legends are common to many dials, the recorded number is probably close upon a thousand.

ANTI-ADULTERATION.

BILL PREPARED FOR CONGRESS BY THE U. S. DAIRY AND FOOD COMMISSIONERS' ASSOCIATION IN CLEVELAND, O., NOV. 29, 1889.

A Bill to Prevent Adulteration of Food and Drugs.

SECTION 1. Be it enacted, etc., that there shall be established in the Department of ——— a bureau to be known as the Bureau on Adulteration. The President shall appoint by and with the advice of the Senate a competent chief officer of said bureau, who shall receive a salary of $5,000 per year, and hold office for four years and until his successor is appointed. The chief of said bureau may appoint, with the approval of the Secretary of the Department of ———, such chemists, inspectors and clerks, not exceeding ten in number, with such salaries as the Secretary of the Department of ——— may approve, provided that the total expenses of inspectors and employés, but exclusive of suitable offices, laboratory, stationery and supplies, which shall be provided by the Secretary of the Department of ———, shall not exceed $50,000 per annum.

SEC. 2. That no person or corporation shall transport or cause to be transported from the State, district or territory in which he resides or does business, into any State or territory, or from any foreign country or other State or territory, into the State or territory in which he resides or does business, for sale or barter, or to be offered for sale or barter, any article of food or drugs adulterated within the meaning of this act, and any person violating the above provisions shall be deemed guilty of a misdemeanor, and upon conviction thereof shall, for the first offence, be fined not more than $100, and for each subsequent offence not more than $500, or imprisonment not exceeding one year, or both, in the discretion of the court.

SEC. 3. That no person shall, within the District of Columbia, or in any of the territories, or in any fort, arsenal, dockyard or reservation, or other place under the jurisdiction of the United States, manufacture, offer for sale, or sell any article of food or drugs which is adulterated within the meaning of this act; and any person violating this provision shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished as provided in the preceding section.

SEC. 4. That it shall be the duty of all collectors of customs, through the appraisers or other proper officers, to cause examinations to be made of articles of food or drugs which may appear to be adulterated, and if, on examination of any article of food or drugs, imported from any foreign country, it is found to be adulterated within the meaning of this act, a return to that effect shall be made upon the invoice, and articles so noted shall not be permitted to pass the custom-house, or be delivered to the consignees, unless on re-examination, as provided for in this act, it shall be found that the said articles are not adulterated.

SEC. 5. That the owner or consignee shall have the privilege of calling at his own expense, for re-examination, and on depositing with the collector of customs, such sum as said collector may deem sufficient to defray such expense, it shall be the duty of the collector of customs to procure a certificate under oath, from a public analyst, of a careful analysis of the articles in question; and in case the report by certificate of the analyst shall declare the report of the officer who examined the goods to be erroneous and the said articles to be unadulterated, the said articles shall be returned to the owner or consignee and pass without reservation on payment of duties, if any. But in case the officer's return shall be sustained by the analyst, the said articles shall be destroyed; provided that the owner or consignee, on payment of charges of storage and other expenses necessarily incurred by the United States, and on giving bond, with sureties satisfactory to the collector, agreeing to remove said articles from the United States, shall have the privilege of re-exporting them at any time within the period of six months after the date of the report of the inspector or public analyst.

SEC. 6. That in order to carry into effect the provisions of this act the Secretary of the Treasury is hereby authorized to appoint from names submitted to him for that purpose by the National Bureau on Adulteration, one or more suitably qualified persons as inspectors and public analysts for adulterated food and drugs at such ports of entry, and with such compensation, as the Secretary of the Treasury may deem expedient; and it shall be the duty of the National Bureau on Adulteration to prepare instructions governing the work of such inspectors and analysts, which, when approved by the Secretary of the Treasury, shall govern their action and that of collectors of customs in preventing importation from foreign countries of food or drugs adulterated within the meaning of this act.

SEC. 7. That the National Bureau on Adulteration shall make, or cause to be made, examination of specimens of food and drugs collected under its direction in various parts of the country, and shall publish in a weekly bulletin the results of such analysis. If it shall appear from such examination that any of the provisions of this act have been violated, the bureau shall at once report the fact to the proper United States District Attorney, with a copy of the results of the analysis, duly authenticated by the analyst under oath.

SEC. 8. That it shall be the duty of every district attorney, to whom the National Bureau on Adulteration or any collector of customs shall report any violation of this act, to cause proper proceedings to be commenced and prosecuted without delay for the fines and penalties in such case provided, unless upon inquiry and examination he shall decide that such proceedings cannot probably be sustained, in which case he shall report the facts to the National Bureau on Adulteration. And for the expenses incurred and services rendered in all such cases the district attorney shall receive and be paid from the Treasury such sum as the Secretary of the Treasury shall deem just and reasonable, upon the certificate of the judge before whom such cases are tried or disposed of.

SEC. 9. That an article shall be deemed to be adulterated within the meaning of this act—

(*a*) In the case of drugs:

1. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein.

2. If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on *materia medica*, it differs materially from the standard of strength, quality or purity laid down in such work.

3. If its strength or purity falls below the professed standard under which it is sold.

(*b*) In the case of food:

1. If any substance or substances have been mixed with it, so as to lower or depreciate or injuriously affect its quality, strength or purity.

2. If any inferior or cheaper substance or substances have been substituted, wholly or in part, for it.

3. If any valuable or necessary constituent or ingredient has been, wholly or in part, subtracted from it.

4. If it is an imitation of, or is sold under the name of another article.

5. If it consists, wholly or in part, of a diseased, decomposed, putrid, infected, tainted or rotten animal or vegetable substance or article, whether manufactured or not; or in the case of milk, if it is the product of a diseased animal.

6. If it is colored, coated, polished or powdered, whereby damage or inferiority is concealed; or if, by any means, it is made to appear better or of greater value than it really is.

7. If it contains any added substance or ingredient which is poisonous or injurious to health; provided that the provisions of this act shall not apply to mixtures or compounds recognized as ordinary articles of food, if the same be distinctly labeled as mixtures or compounds with the name and per cent. of each ingredient therein, and are not injurious to health.

SEC. 10. The term "drug," as used in this act, shall include all medicines for internal or external use. The term "food," as used herein, shall include all articles used for food or drink by man, whether simple, mixed or compound.

SEC. 11. Every person manufacturing, offering or exposing for sale, or delivering to a purchaser, any drug or article of food included in the provisions of this act, shall furnish to any person interested, or demanding the same, who shall apply to him for the purpose, and shall tender him the value of the same, a sample sufficient for the analysis of any such article of food which is in his possession.

SEC. 12. Whoever refuses to comply, upon demand, with the requirements of Section 11, shall be guilty of a misdemeanor, and, upon conviction, shall be fined not exceeding one hundred, or less than ten dollars, or imprisoned not exceeding one hundred, or less than thirty days, or both. And any person found guilty of manufacturing, offering for sale, or selling an adulterated article of food or drug under the provisions of this act, shall be adjudged to pay, in addition to the penalties heretofore provided for, all the necessary costs and expenses incurred in inspecting and analyzing such adulterated articles, of which said person may have been found guilty of manufacturing, selling, or offering for sale.

SEC. 13. This act shall take effect and be in force from and after its passage.

ANCIENT WISDOM.

THE SCIENTIFIC KNOWLEDGE OF THE ANCIENT GREEKS AND ROMANS.

(*Continued from Vol. 5 p. 592.*)

The father of the science of acoustics was the famous philosopher Pythagoras, who was born at Samos, at the end of the seventh century B. C. We are often told that he was led to the discovery of the arithmetical relations of the musical scale by observing accidentally the various sounds which were produced by hammers of different weights striking upon an anvil, Longfellow refers to this old story in his poem "To a Child":

> As great Pythagoras of yore,
> Standing beside the blacksmith's door,
> And hearing the hammers, as they smote
> The anvils with a different note,
> Stole from the varying tones that hung
> Vibrant on every iron tongue,
> The secret of the sounding wire,
> And formed the seven-chored lyre.

But, unfortunately for the truth of the story, different hammers do not produce different sounds upon the same anvil. It seems certain, however, that Pythagoras invented the monochord, which is thus the first known apparatus for the experimental investigation of natural laws. By means of this, he discovered that all intervals of sound which make a pleasant and harmonious impression on our ears, correspond to the simplest numerical relations; that, for example, if a string of the length s gave the keynote, $\frac{1}{2}s$ and $\frac{4}{5}s$ gave the octave and the third. Euclides, or Euclid, the famous geometer, collected the results reached by Pythagoras and his school giving us an arithmetical demonstration of the way of dividing the scale; while among the Romans Vitruvius and Bœthius wrote on the same subject, but without making any original contributions to it. The first to undertake to explain the phenomena of sound was Aristotle. He discovered that the air was the medium by which all sounds were transmitted, and observed that the velocity with which they travelled, differed on different days and at different seasons of the

year. Vitruvius applied acoustic principles to the construction of theatres. He explains clearly that sound travels in waves of air, spreading in all directions from the sonorous body.

Of the laws of heat, the ancients knew practically nothing, having a merely empirical knowledge of the ordinary processes of melting, freezing, boiling and the like. They developed heat by burning, by friction, and by the concentration of the sun's rays. They knew that steam and air were expanded by heat. Aristotle, who investigated the subject was prevented from accomplishing anything by assuming at the outset that heat and cold were radically independent things, instead of differing merely in degree. He seems, however, to have recognized a definite melting-point for various metals, and he explains the ready melting of "Celtic tin" by the weak cohesion of its molecules. He also appears to have had some idea of latent heat. Among the Romans, we find the use of a principle of heat by a man who, least of all, would have claimed the glory of being a savant—the grim old censor, Marcus Porcius Cato. In describing the preparation of a certain dish, he says that the ingredients are put into an earthen vessel; this in turn is put into a pot full of water, which is set over the fire. Here we have a suggestion of the method afterwards employed by the Arabs, and familiar in our day, for maintaining a given temperature in water-baths.

In optics, far greater advances were made than in the two departments of physics already reviewed. At first, the idea of the process of sight was a wholly inverted one, for it was supposed that the course of light was from the eye to the object seen, long feelers going out from the organ of vision, which formed a conception of the object viewed by actual contact with its surface. Epicurus and Hipparchus assumed the existence of visual rays proceeding from the eye, and the ancient geometers described spheres which resulted from the union of the beams from the two eyes, those from the right eye turning to the left, and *vice versa*. They maintained that while the eye could take in a great many objects, a distinct impression was received only where the rays met. The first to write on the subject was Euclid, a believer in the "feeler" theory. While he made many errors, he showed that the angle of incidence is equal to the angle of reflection, and in one of his theorems gives the germ of the idea of linear perspective. The next in order in the development of the subject is Cleomedes, whose work is largely a compilation of that of Poseidonius, a contemporary of Cicero. He is the first to show a knowledge of the principle of refraction, which he illustrates by the familiar experiment with the coin in water; and he explains the phenomenon of twilight on that principle. Ptolemains, or Ptolemy, the well-known mathematician and astronomer, wrote on the theory of light, and defined the angles of incidence and reflection for various refracting media. While it was left for Descartes to discover the laws of refraction, Ptolemains laid the foundation for later investigations. A work on mirrors which was formerly attributed to Ptolemains, is now believed to be the work of the versatile Heron, who did such good service in the field of mechanics. He gives a description of a heliostat, by which a ray of sunlight was introduced into a darkened room and kept in a given position; of a mirror which distorted the image reflected, and of an apparatus for producing ghostly apparitions on the stage similar to those now employed for that purpose. The ancients were acquainted with various optical instruments. Mirrors were known at a very early period. They were made of various metals, and of polished stone. Nero had a mirror of emerald and Pliny tells us that mirrors were made of rubies, though this stone is never found now sufficiently large for the purpose. The mirrors made at Brundisium, from a mixture of tin and copper were celebrated. The white metal thus produced readily becomes dim, and a sponge with powdered pumice-stone was generally fastened to them for renewing the polish. The use of silver mirrors was very common at Rome. Glass mirrors are spoken of by Pliny and others. Burning-glasses were known at Athens as early as the time of the Peloponnesian war, for Aristophanes makes one of his characters use one to obliterate a charge against him which was recorded on a wax tablet. The burning-glasses of Archimedes have already been referred to. This instrument was also used by the vestal virgins to rekindle the sacred fire, if, by any unhappy chance, it was extinguished. Magnifying glasses were known to the Romans, and the short-sighted emperor Nero is said to have used one at the theatre. This instrument was similar to our modern spectacles or eye-glasses, rather than to opera glasses. The vexed question whether anything corresponding to the opera glass or the telescope was known to the ancients, seems to have been answered in the negative, although they may have used an empty tube to aid their sight in certain cases. The question whether the sense of color of the ancients was less developed than our own, has been much discussed, and the attempt has been made to prove that Homer was partially color-blind. Aristotle distinguished only three—or at most four—colors in the rainbow, though he could probably have passed a modern examination for color-blindness.

The subjects of magnetism and electricity must be left for another paper.—*Dr. J. C. Rolfe, in Pop. Sci. News.*

THE FRENCH MENU.

SOME OF THE QUEER NAMES APPLIED TO THEIR DISHES BY FRENCH COOKS.

Those persons who object to the French names of dishes as given on *menus*, and want them in English, would be much amused with a literal translation of them. For instance, *Puits d'amour* means fountains of love; *anis etiole*, starry anise-seed; *ailes de poularde au soleil*, pullets' wings in the sun; *des œufs a l'aurore*, eggs blushing like aurora; *bœuf a l'ecarlate*, beef in scarlet; *sauce en petit deuil*, sauce in half mourning, and *haricots vierges*, white virgin beans. French cooks, too, are ingenious in the new dishes as well as in the epithets they attach to them. Thus we have *culotte a la royale, sauce veloute*, breeches in the royal fashion, with velvet sauce; *tendons de veau en queue de paon*, tendons of veal in a peacock's tail, and *epaule de mouton en ballon, en musette*, a shoulder of mutton in a balloon or a bag-pipe. Sometimes their names are so fanciful as to be totally incomprehensible, especially if you look for them in a dictionary; such as *palais de bœuf en Cracovie*, a palace of beef in Cracovia; *fraises de veau*, strawberries of veal; *ris de veau en amourette*, the amorous smiles of a calf; *flotte, sauce tomate*, a fleet with tomato sauce, and *des œufs au miroir*, eggs in a looking-glass. But there are many of their dishes which are monstrous, and show a strong tendency to cannibalism; for instance: *Salmi de chasseurs*, a hash of huntsmen; *compote de bons chretiens*, a stew of good Christians; *bouchee de dames*, a mouthful of ladies; *espagnoles maigres*, tin Spanish women, and *quatre mendimants*, four beggars on a plate.

They like *veau a l'atouffade*, liver of veal, and *poulets a l'ivoire*, chickens like ivory. Other dishes are, on the contrary, quite shadowy and unsubstantial, such as *accolade de lievre a l' broche*, an embrace of a hare on a spit; *semelles de perdrix* partridges' shoe-soles; *souffle de rose*, the breath of a rose, and *une jonquille entiere*, a whole jonquil. The French cook, too, has a way of serving up his dishes which is as extraordinary as the rest. What should we think of *merlans en turban*, whitings in turbans; *eperlans en cornets*, smelts in dice-boxes; *raie bouclee aux capres*, a skate buckled to capers; or of the cook who would be so untidy as to send to table *truffles a la cendre*, truffles in ashes.

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FAITH FOLLIES.

CURRENT EXPOSURES OF CRIMINAL CHRISTIAN SCIENCE.

A Young Girl done to Death in Boston.

The latest horror reported in connection with the murderous "Faith Cure" humbug comes from Boston, Mass. A despatch from that city dated January 9, says:

The Christian Science craze seems to have been responsible for the untimely death of a fair young Tennessee girl in this city a few days ago. She really had consumption, but she was persuaded that it was only an error of belief, and then her so-called scientific advisers forced her to undergo the most heroic treatment of the body in order to dispossess her mind of that erroneous impression. Miss Florence Gillespie, daughter of J. G. Gillespie of Chattanooga, was the victim. She had consumption, it is true, but she was surrounded by all the luxuries of a well-appointed home, and there were apparently many years of life for her. Some of her relatives were Christian Science practitioners, and they brought Miss Gillespie to Boston, to get her within reach of the influence of the head centre of the belief. This was on the first of October. Apartments were secured at 29 Claremont Park, and for three months the consumptive was forced to undergo peculiar treatment. The struggle she made against her fatal disease in the endeavor to bear out the reiterated statement of her Christian Scientist advisers that there was "nothing really the matter with her," was nothing short of heroic. She made a daily visit, regardless of the weather, to a science "doctor." Under the regimen prescribed, her usual hour for rising in the morning was 6.30, or when awake. In accordance with the theory that her pains were only imagination and that she was not sick, Miss Gillespie did a great deal of work almost to the hour that she died. She did some of the cooking as well as other work. This compelled her to go up and down three flights of stairs daily, which often caused her great suffering. Miss Gillespie used often to ask for something to eat between meals, but this was strictly forbidden. At lunch she often asked for a bit of meat or fowl, but it was refused, it being believed that her craving was really nothing but a matter of imagination. Toward the end she tottered often when she went up or down stairs or when going to see her Christian Science doctor. She said that she couldn't understand Christian Science at all, but was trying to do the best she could to carry out her aunt's ideas, of whom she spoke with affection and respect. She often said: "In belief I'm dying," or, "in belief I have the most dreadful pains." Miss Gillespie was obliged to get her own meals the day before she died, and was left alone that night. There is much indignation expressed by her friends in this city over the brutal treatment of the case when there were ample means to have made her last days comfortable, even if there was no chance to ward off the fatal results of the disease for an indefinite period.

SEWING ON BUTTONS.—"When I get a bright idea I always want to pass it along," said a lady, as she sat watching a young girl sewing. "Do your buttons ever come off, Lena?" "Ever? They're always doing it. They are ironed off, washed off, and pulled off, until I despair. I seem to shed buttons at every step." "Make use of these two hints when you are sewing them on, then, and see if they make any difference. When you begin, before you lay the button on the cloth, put the thread through so that the knot will be on the right side. That leaves it under the button, and prevents it from being ironed or worn away, and thus beginning the loosening process. Then, before you begin sewing, lay a large pin across the button so that all your threads will go over the pin. After you have finished filling the holes with thread draw out the pin and wind your thread round and round beneath the button. That makes a compact stem to sustain the possible pulling and wear of the buttonhole. It is no exaggeration to say that my buttons never come off, and I'm sure yours won't if you use my method of sewing."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

January.

MEAT.—Beef, mutton, pork, veal.

POULTRY AND GAME.—Chicken, duck, turkey, geese, rabbit, hare, partridge, pheasant, wild fowl, pigeons.

FISH.—Brill, carp, cod, eels, salmon, whiting, haddock, oysters, lobsters, smelt.

VEGETABLES.—Brocoli, beet, cabbage, carrots, celery, onions, parsnips, turnips.

FRUITS.—Apples, pears, oranges, bananas, lemons, nuts.

PRACTICAL RECIPES.

ONION SOUP.—Select three fine onions and cut them into small pieces, fry them to a golden brown in two ounces of butter; take them out of the butter and add them to about two quarts of stock that has been heating meanwhile, cook gently for half an hour, season with pepper and salt and serve.

BOILED CODFISH.—Put two pounds of codfish in slightly salted boiling water, put in also a bit of lemon peel, a few peppers and cloves. When the fish is so tender that the fins may readily be pulled out, it is done; remove from the fire and arrange temptingly on a folded napkin and garnish with parsley. Make a sauce with a dozen oysters; scald them in their liquor, drain them and to their liquor add salt, pepper, a piece of mace and two tablespoonfuls of butter. Mix a teaspoonful of flour smoothly into half a cupful of milk, add to the liquor; simmer a moment, add the oysters; pour into a sauce boat and serve with the fish.

YORKSHIRE PUDDING.—Whisk thoroughly four eggs, and to them add gradually four large tablespoonfuls of flour, a little salt, and enough sweet milk to make a batter thick as cream. Beat well and quickly. About half an hour before the roast beef is done, remove it from the dripping pan to the oven grating; pour nearly all the dripping out of the pan and put in the batter; place the pan under the beef in the bottom of the oven and bake. When ready for serving cut the pudding into squares, and serve in a separate dish from the meat. The pudding should not be over an inch thick.

COCOANUT CANDY.—One pound loaf sugar, one cupful of water, a little of the white of an egg, half a pound desiccated cocoanut. Put the egg, slightly beaten, into the water and pour it over the sugar; when it is dissolved place it over a clear fire and let it boil for a few minutes, set it one side until the scum rises, skim carefully, then boil until the sugar is very thick. Add the cocoanut and stir carefully until done. A little flavoring may be added to taste, and cochineal or other chocolate used for coloring.

SWEET POTATO PIE.—Parboil two good sweet potatoes without peeling. When cold, peel and grate them. Beat together one ounce butter, and a cupful powdered sugar until light, add the yolks of three eggs and beat thoroughly, then gradually add the potatoes, half a pint of milk and a little powdered cinnamon. Bake with under crust only for about thirty minutes. When done whip up the egg whites, add to them two tablespoonfuls powdered sugar and put over the pie. Return to the oven to brown slightly. Serve cold.

CENTENNIAL ROLLS.—To each quart of sifted flour, loosely measured, add two heaping teaspoonfuls Horsford's Baking Powder, a little salt, and then sift. Mix with sweet milk and water, or milk alone, making a dough just stiff enough to roll and cut. Bake immediately in a quick oven. Use no shortening.

MUSTARD RELISH FOR FISH OR COLD MEATS.—Stir three tablespoonfuls of dry mustard into the beaten yokes of two eggs, add one tablespoonful cayenne, one tablespoonful salt, one tablespoonful oil, one tablespoonful sugar, half a cupful of vinegar. Beat well to the consistency of custard. If too thick, thin out with vinegar, or if too thin add more mustard.

COOKING REFORM.

[Extracts from a paper read by Edward Atkinson, LL. D. at the Brooklyn meeting of the American Public Health Association.]

My Aladdin ovens, so called, are adapted to methods of cooking corresponding to broiling, roasting, baking and braising; but they can also be used for boiling and simmering. My Aladdin cooker, so called, in which the heat is conveyed through water, is devoted wholly to boiling, stewing and simmering, especially the latter. I neither attempt or desire to *fry* anything in either kind of apparatus. About nine-tenths of all the cooking of my somewhat large family has been done with this apparatus for nearly two years, and I also have an office unch-room for the use of about twenty employés, in which no other apparatus is or can be used. My summer kitchen at my seaside house is fitted with a grill which is very seldom used. It proves to be most convenient to use the cooking stove, heated with hardwood chips, for boiling the water for tea and for occasional frying. My winter kitchen is a large one, and it depends upon the range for warming it. The range, therefore, continues to be used to some extent for cooking, mainly for preparing breakfast; but I contemplate substituting a special stove without any oven, which will heat the room with much less coal, the top of the stove being fitted for cooking in the ordinary way. Neither the oven of the stove in summer nor of the range in winter are now used for cooking; therefore, the kitchen is never overheated and the food is never spoiled. We have occasionally failed to cook a large joint of meat a sufficient time, but we have never spoiled a dish in the process of cooking since the pulp or jacketed oven was adopted. What, then, are the simple principals of the science of cooking? I think they may be stated in a few very plain terms.

1. The heat should be derived from fuel which can be wholly consumed or wholly converted into the products of complete combustion without any chimney except that of the lamp or burner. The same may be said of illuminating gas when used in one of the burners of the Bunsen type which supply an excess of oxygen and yield the blue flame. The combustion of oil and of gas can be brought under absolute control by gauging the size of wick or burner to the work to be done.

2. The oven in which the food is to be subjected to this measurable and controllable source of heat must be so constructed that the heat imparted to it may be entrapped and accumulated up to a certain measure or degree and then maintained at that temperature without substantial variation until the work is done. This can be done by jacketing the oven in a suitable way with material which is incombustible and also a non-conductor of heat.

3. There should be no direct communication between the true oven or receptacle in which the food is placed and the source of heat, least the food should be exposed to being in places burned or scorched.

These three conditions are all accomplished in the two somewhat crude and probably incomplete inventions which I have named the "Aladdin Cooker" and the "Aladdin Oven," in both of which the heat derived from common lamps, such as are used for lighting, may be stored or accumulated so as to do the work of cooking in a very perfect manner. In the cooker the heat is imparted to water in an attachment to a metal-lined wooden box corresponding to the water-back of the common range or stove, and the work is done by the contact of the hot water with the outside of the porcelain vessels in which the food is placed, or by the steam generated when the water is heated to the boiling point. In the oven a column of heated air is carried from the chimney of the lamp to the inside of an outer oven made chiefly of prepared wood pulp, but outside of the inner sheet-iron or metallic oven in which the food is placed, which inner oven is separately ventilated. I do not claim originality in these simple principles or in the idea of jacketing an oven with non-conductors of heat. All these matters are well understood by every intelligent stove manufacturer, but it is practically impossible for any one to apply them in making stoves such as will meet the demand of the market, for two reasons.

1. The greatest demand for stoves is that of people of very moderate means, who are too much controlled by the price in making a choice, making the common error in confounding cheapness with low price, an error which leads to great waste not only in the matter of stoves, but in many other ways.

2. The absolute and imperative preference of the public for a stove in or upon which the work can be done very quickly.

The custom of cooking quickly is in part a matter of choice, and in part due to the necessity to which a great many working people are subject to cooking their meals quickly or else to go without hot breakfasts and dinners. Another great obstruction to improvement in the art of cooking is the almost universal misconception that the finer cuts of meat are more nutritious than the coarser portions, coupled with the almost universal prejudice among working people against stewed food. This prejudice is doubtless due to the tasteless quality of boiled meat. Boiling toughens each of the fine fibres, and deprives the meat almost wholly of its distinctive flavor. All these blunders and misconceptions must evidently be removed before any true art of cooking can become common practice. The more necessary, however, does it become to invent apparatus in which meat can only be simmered and cannot boil, as in the Aladdin cooker, and also to invent a stove or oven in which neither meat nor bread can be overcooked, dried up, or rendered indigestible by too much heat, as in the Aladdin oven. Next, people must be persuaded that a better and more nutritious breakfast can be made ready to eat, as soon as the family are out of bed, by putting meat stews, oatmeal, brown bread, and many kinds of puddings, into the cooker and simmering all night by the use of a single safe lamp, than in any other way. People must be taught that the dinner can be put in the oven, when the husband and wife go to the mill to work, and so treated that it may be found perfectly cooked at noon, without requiring any attention in the interval. People must be taught that the best of bread, raised with good yeast, can be mixed and kneaded between 12.30 and 1 p. m., placed in a bread-raiser, which will raise it ready for the oven at 6 or 7 p. m., and that this bread may be perfectly baked in two hours by the heat of the evening lamp, which at the same time serves to give light for reading or sewing. All this can be accomplished with my crude apparatus, but, until some skilful stove maker takes up these inventions and makes the ovens in large numbers at low cost, my own efforts must be directed mainly toward ameliorating the condition of the rich, saving the houses of the well-to-do from the heat and smell of the present bad methods, and in this way creating a demand for my ovens which, while made in small numbers by hand-work, are too costly for general use, although in an ordinary family they will pay for themselves in six months.

CHEERFUL NEWS for newspaper proprietors comes from Ohio. A paper in that State recently brought suit against forty-three men who would not pay their subscriptions, and obtained judgments for the full amount in each case. Twenty-eight at once prevented attachment by making affidavit that they owned no more than the law allowed. Under the decision of the Supreme Court they were arrested for petit larceny and bound over to the sum of $300 each. Six of these did not give bonds and went to jail. That is the result of the new postal law which makes it larceny to take a paper and refuse to pay for it.—*Western Journalist.*

Bridging Behring Straits.—John Muir says that he has by no means yet completed his explorations in Alaska. Although the bridging of Behring Straits has been widely ridiculed, Muir is inclined to think that such a feat will one day be accomplished. He says: "Senator Stanford's girdle of steel around the earth via Behring Sea is a perfectly feasible scheme. Behring Straits can be bridged. It is only sixty miles across in the narrowest place, and there are three islands strung along in it. This would divide the bridge up into four divisions. But, besides this, the water is very shallow. In many places it is not over twenty feet deep. I undertake to say that if a man was strong enough to take one of our California redwood trees in his hands he could put it down anywhere over the 600 miles of Behring Sea and yet have 100 feet of it left above the water. This shows how easy it would be to bridge the straits. The only trouble would be from floating icebergs, but that could be easily overcome by constructing swinging bridges, like they have across the river at Chicago. In this way the straits could be kept clear all the time, and trains of cars could run right along.

The Dew Rises.—It is now held by the best physicists that, instead of falling from above, the dew rises from the earth. The generally received opinion that the dew is formed of vapor existing at the time in the atmosphere must be given up for the established fact that the vapor which rises from the heated earth is trapped by the cold surface earth. Besides, when we imagine that, on a cool evening after a sultry day in summer our feet are being wet by the dew on the grass, we make a grave mistake. For that moisture on the grass is not dew at all, it is false dew—in reality, the transpired humor of the plants. The drops at the tips, which glisten diamond-like, are not dew; close examination shows that these crystalline spheres are all situated at the points where the veins of the leaves cut the outer edges. These drops only give evidence of the vitality of the plant. The difference between the true dew on the grass and the exuded drops through the veins from within the grass can be easily distinguished, for the former is distributed all over the blade in a moist film, whereas the latter are of some size, and are situated near the tips of the blade. Altered, then, is the meaning of the line, "Ilka blade o' grass kept its ain drap o' dew;" for those brilliant globules on the petal, shaking to the same sweet air, and often "gliding at once all fragrant into one;" are not dew drops, but are the exudations of the healthy plants. They give evidence of the elixir vitæ of vegetation; whereas the true dew is the pearly lustre, varnished in filmy humidity over the blades by that wondrous alchemy which transforms the water vapor rising from the ground into the plant-refreshing dew.

Mastodon Remains in Alaska.—"There are so many strange things in Alaska," added the discoverer of the Muir glacier, "that have not yet come to the knowledge of the public that one who has seen them hesitates where to begin. Elephant remains are found all over the great valley of the Yukon. As a matter of fact they are found everywhere throughout the great western slope of Alaska. Dana and Sir Charles Lyle startled the world by announcing that hairy frozen elephants were found wedged among the Siberian icebergs, but scarcely anybody knows that throughout Alaska are the remains of countless thousands of mastodons. You can dig them out and find them on the surface everywhere. I saw hundreds of them, possibly, on my last trip, and I am now anxiously trying to get up there to complete my investigations. So thick are the elephant remains that the native Indians, on finding them buried partially in the ground, decided they were some kind of great mole that burrows in the soil. This is the story given me. I collected a lot or remains. The collecting of elephant tusks every summer is a regular business in Siberia just over Behring sea. We have just as many of them on the Alaska side as they ever had in Siberia. Ages ago great herds of elephants roamed over these shores. Perhaps they existed down to a comparatively recent date, too, for the hairy bodies and well-preserved bones were evidences of that.

The Schoolmaster Abroad.—The Russians have recently improved on the sleeping-coaches of the railway and the perambulating schoolmaster of the rural regions. They have provided a school-wagon, which is furnished with a room for the teacher, a class room or study and a library, all suitably supplied with the necessary material. This wagon will be on the line of the Transcaspian Railway all the year ronnd, remaining as long as may be deemed necessary at districts which are not provided with a school.

Phases of Real Manhood.—Three things to admire—intellectual power, dignity, gracefulness. Three things to love—courage, gentleness, affection. Three things to hate—cruelty, arrogance, ingratitude. Three things to despise—meanness, affectation, envy. Three things to reverence—religion, justice, self-denial. Three things to delight in—beauty, frankness, freedom. Three things to wish for—faith, peace, purity of heart. Three things to esteem—wisdom, prudence, firmness. Three things to like—cordiality, good humor, mirthfulness. Three things to suspect—flattery, hypocrisy, sudden affection. Three things to avoid—idleness, loquacity, flippant jesting. Three things to cultivate—good books, good friends, good humor. Three things to contend for—honor, country, friends. Three things to govern—temper, impulse, the tongue. Three things to be prepared for—change, decay, death.—*Telegram.*

Transmission of Scarlatina Through Circulating Libraries.—*Semaine Med.* relates that an English physician has informed the authority of a well authenticated case of transmission of scarlatina through a book taken from a circulating library. He points out that the circulation of such books is an easy means of spreading contagious matters, because infectious particles are very liable to stick to books and because convalescents are very fond of reading. For this reason, the English authority has decided that persons affected with contagious diseases, who take books from a circulating library, thereby facilitating the dissemination of the disease, are guilty of a misdemeanor and amenable to the law.

Benzine is Dangerous.—It is announced that recent experiments made with benzine demonstrate the fact that one volume of benzine will render 16,000 volumes of air inflammable and 5,000 volumes of air violently explosive.

Revised Romanism.—The Vatican is said to be preparing a new catechism for universal use.

Wood Preservative.—Naphthaline is now quite extensively used as a wood preservative, and it is said to be very effective.

HOW LARGE WAS ANCIENT ROME?—After carefully examining all the data we have, all the statements of the various ancient writers who allude to it, and all the facts which seem to bear on the question, I am convinced that in estimating the number at 4,000,000 I am rather understating than overstating it. It is much more probable that it was larger than that it was smaller. De Quincy also estimates the inhabitants of Rome at 4,000,000. I will only cite one fact, and then leave this question. The Circus Maximus was constructed to hold 250,000, or, according to Victor, at a later period probably 385,000 spectators. Taking the smaller number, then, it would be one in sixteen of all the inhabitants if there were 4,000,000. But as one-half the population was composed of slaves, who must be struck out of the spectators, when the circus was built there would be accommodation then for one in eight of the total population, excluding slaves. Reducing again the number one-half by striking out the women, there would be room for one in four. Again, striking out the young children and the old men and the sick and impotent, you would have accommodation for nearly the whole population. Is it possible to believe that the Romans constructed a circus to hold the entire population of Rome capable of going to it?—for such must have been the case were there only 4,000,000 of inhabitants. But suppose there were only 1,000,000 inhabitants, it is plain from the mere figures that it would never have been possible to half fill the circus.—*Blackwood's Magazine.*

EPIDEMIC INFLUENZA OR GRIPPE.

A sneeze which encircles the globe is not without a certain amount of dignity and importance, and therefore the epidemic of influenza which has reached the banks of the Seine deserves more than a passing notice. No one seems to know exactly where the present epidemic originally started, but its symptoms and effects are so similar to the dengue fever which has been raging for the last few months in Greece, Turkey and Egypt, that belief in its Eastern and Asiatic origin appears to be well founded. This hypothesis is further confirmed by the fact that the numerous epidemics of a similar nature which swept over Europe previous to 1830, have reached Russia from the Orient along the caravan routes. In the Czar's dominions it was known by the name of the "Chinese Malady," while in Germany it was designated as the "Russian catarrh." In Italy it figured as the "German illness," and in France it was described as caused by fogs brought from the opposite banks of the Rhine by Teuton winds, "remplis de malignite" (laden with malignity). Epidemics always follow the main trade routes, and now that the principal portion of Asiatic commerce enters Europe via Egypt instead of via Persia or the caravan trails from China, the invasion of cholera, influenza, and other afflictions invariably travel by way of the Suez Canal and the Nile Delta. The causes of the epidemics of influenza appear, as in the case of dengue fever, to be principally atmospheric. Barbier, in his history of King Louis XV., mentions that the outbreak in Paris, in February 1733, was preceded and attended by fogs, so thick and black, that lighted lanterns could not be seen. In the streets everybody walked with links and candles in their hands, and yet had much ado to find their doors. Curiously enough, the beginning of the present epidemic at St. Petersburg was coincident with the presence of heavy clouds, semi-darkness and horrible weather. The epidemics of influenza are rapid and sudden in their onslaught, and the impression which this suddenness has made on the popular mind is evinced by the names which have frequently been applied to it, thus, in Germany it has been frequently called the Blitz Catarrh (lightning cold), while the French have christened it as "la grippe," a word derived from the verb "gripper," which signifies to snatch or to grab. The symptoms are familiar to all those who have resided in the Orient, and who have suffered from dengue fever. There are the same mental depression, feverish cold and gastric disturbances on the first day of the malady, which are followed on the four succeeding days by an invincible state of somnolency. On the fifth or sixth day the latter disappears, and gives place to vomiting, and the patient then recovers as rapidly as he fell ill. Through some strange reason or other the epidemic influenza attacks men and animals in preference to women, who appear to enjoy an immunity therefrom, at any rate to a great extent. Horses, asses, dogs and cats are effected thereby, and even a mule becomes subdued when attacked by influenza, and ceases his kicking and bucking in order to wheeze and cough. This disease has reached our shores, but while we would not by any means make light of it, as it is frequently accompanied by pneumonia, we believe that persons who pay attention to the ordinary rules of sanitation and keep their system in good order almost always escape it. A good way to do this is by the regular use of Dr. J. C. Ayer's sarsaparilla, which will keep the absorbent vessels of the system in condition, and than which there is no better preparation. In case of attack, Dr. Ayer's Cherry Pectoral will instantly relieve the annoying symptoms of the cough. And by the way, even if you are not troubled with the grippe, but have only a simple cold, the same rules apply. In the first invasion of the disease, a dose of Ayer's Pills is strongly recommended.

BUSINESS NOTES.

HORSFORD'S ACID PHOSPHATE.

Dr. W. B. Gillies, Winnipeg, Manitoba, says: "I have used it in a typical case of indigestion with biliousness, and found it to be, without exception, the best thing I ever used in such cases."

Dr. J. R. Fortson, Kiowa, Ind. Ter., says: "I have tried it for constipation, with success, and think it worthy a thorough trial by the profession; for night sweats of consumption, gives speedy benefit."

AMERICAN ANALYST

A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

CHEAPNESS AND QUALITY.

We have repeatedly had occasion to advert to the fact that the adulteration evil is largely, if not principally, due to the public itself, in its greedy desire to effect imaginary "bargains" by purchasing commodities at lower prices than those at which they can possibly be produced. After deceiving ourselves in that manner we turn indignantly upon the manufacturing community and denounce it for consummating the fraud which we ourselves had suggested and insisted upon. The weak and illogical propensity referred to is not peculiar to the American housekeeper alone, but manifests itself universally. It is to be classed, doubtless, among the numerous innate inconsistencies of human nature. People do not act blindly in this respect, for it is an everywhere accepted axiom that good articles are the cheapest in the long run, and that nothing is saved by false economy in the purchase of impure food products. Complaints of the same self-imposed evil come to us from across the Atlantic. A London writer says: "The insatiate mania for cheapness has done much to deteriorate and injure the character of very many British manufactures. It may not do much serious harm to produce shoddy woollens, over-sized calicoes and clayed papers, but in the matter of food and drinks adulteration and deterioration are highly injurious and objectionable. Frozen meat, margarine butter, saccharine and glucose substituted for sugar, mixed olive oil, starch-cocoa and chiccory-coffee cannot be called beneficial to health." So, likewise in France, the grasping desire to obtain something for nothing has, with other things, lowered the standard of the wines for which that country was so long and so justly famous, to the point of absurdity. The following advertisement, which we translate from the *Petit Journal*, of Paris, exceeds in effrontery anything of the kind that we remember to have ever seen in that line: "Red wine at one penny the quart, as in 1846. Readers, here is the thirsty season down upon us. Don't go and poison yourselves with adulterated wines. Buy all my Annamite product, and make your wine yourself in two days without either raisins or alcohol. This wine thus prepared is as good as the good Burgundies. It is red, warranted for analysis, and weighs from 8 to 10 degrees of alcohol. Price of a box, 2s. Three boxes for 5s." The coolness of it is refreshing. The public are cheerfully encouraged to avoid adulterations by making their own wine from a compound that contains neither grape juice nor alcohol. Such a latter-day miracle goes beyond the wonderful Bowery concoctions described some time since by the AMERICAN ANALYST in an account of "The Lair of the Adulterator" in this city. But it is to be borne in mind that if the public did not encourage such traffic, the abomination of cheap sophistications would be easily extinguished.

CALIFORNIA AND SOUTH AMERICA.

The recent Pan-American Congress in Washington has attracted wider attention to the nations of South America than was ever before bestowed upon them, and the result is visible in the prevalence of a broader and more intelligent appreciation of their producing capabilities, and the probable relation of the latter to our own industries. An illustration is afforded by a recent warning pronounced by the *Fruit Grower*, of San Francisco. Our contemporary, discussing the future of raisin culture, says: "California has every right to feel proud of her fruit industrial conquests; but we should not be like the deluded ostrich which inserts its head in the sand and imagines that there is no outside world. California is not the only undeveloped country that can produce good oranges and raisins. There will be other countries coming to the front, that will prove no mean rivals. The Argentine Republic is a country great in possibilities, which is at the present time receiving an immense immigration from Spain. Many of these immigrants come from the raisin districts. Not only this, but having found a country adapted to the culture of the vine, they have, if reports be true, succeeded in making a raisin which equals in quality anything produced in Spain. The land does not cost $1,000 per acre, but is virtually given to them by the government, which also supplies tools with which to work. South American countries are fast being populated, and there are vast sections which are said to be as perfectly adapted to fruit culture of every kind as is California. Our home markets are great and in a sense comparatively undeveloped as yet, so California may not have much to fear from competition except for prospective export; but the time may come when we may have to yield the palm or divide the honors for supremacy."

A DESTRUCTIVE WEAPON.

Inventive science seems to be rapidly converting warfare into too destructive a pastime for great nations to indulge in hereafter. A recent French repeating air rifle, appropriately called the "miracle gun," is attracting serious attention in Germany. The weapon was invented by M. Paul Giffard, in Paris, the original projector of the Parisian pneumatic post. It is described thus: "The weapon is light, much lighter than any of the army rifles now in use. It resembles the magazine gun in that a steel cartridge about a span and a half long and as thick as a man's thumb, is attached to the one barrel by means of a screw. This cartridge contains 300 shots, which can be discharged as rapidly or slowly as a man desires. Since neither powder nor any other explosive, but only compressed and liquefied air, supplies the expelling force, no smoke and no flash accompany the discharge. Only a short, sharp, low report is heard as the ball leaves the cartridge. At the recent trial the ball travelled with wonderful accuracy and penetrated deep into the wall of the shooting room. As soon as one cartridge is emptied of its 300 shots, another cartridge can be screwed on the gun in the twinkling of an eye. M. Giffard says that the 300 shots in a cartridge can be produced at a cost of about two and a half cents. The gun itself can be manufactured for about five dollars."

NEW YORK FOR 1892.

On January 11th the claims of New York City as the proper site for the World's Fair to be held in 1892, in celebration of the four hundredth anniversary of the discovery of America, were brilliantly set forth before the special committee of the U. S. Senate in Washington, by Chauncey M. Depew, Bourke Cochran, and other eloquent speakers. One of the strongest arguments presented has been mostly overlooked by the press from the circumstance that it was tendered in writing by the member of the New York delegation who prepared it. The writer says: "There are occasions when facts and figures speak louder than words. On this one I have collected a few which I desire to present to you. The importations to New York in 1889 amounted, in round figures, to $500,000,000. We paid $147,000,000 for duties on the same, being two-thirds

of all the duties which the Government received during the year. Our exports of merchandise amounted to $365,000,000 — nearly one-half of the exports of the country. The total foreign commerce of the port exceeded $900,000,000. By the ratio of progress made during recent years, it will exceed $1,000,000,000 in 1892. While our tonnage has decreased by reason of unfortunate navigation laws, we still have 4,000 ships registered in our Custom House, representing 928,000 tons—one-quarter of the tonnage of the country. No city is more accessible by land and water; there is none where so many relations connect the inhabitants with those of foreign countries. Our merchants deal with every quarter of the globe. My own firm, comparatively a small one, has at least one direct correspondent in every commercial centre of Europe, and in many cities of the East Indies, Asia Minor and Africa, selling to them products of our country and buying theirs in return. The annual income of our city exceeds $80,000,000, and while comparisons may be odious, I desire to call your attention to the fact that this is four times greater than the combined annual income of the three cities which compete with ours. The assessed valuation of New York City exceeds $1,500,000,000, and New York begins to rival London as a centre of finance and of exchanges. We have 600 miles of streets, 130,000 houses; and nearly 2,000,000 inhabitants. Our hotels are better prepared to accommodate strangers than those of any other city of the Old or New World. None other in this country offers such treasures of fine arts and attractive places of public amusement. While other cities are in a location more central for inhabitants of this country, no place on the continent will draw so many strangers from foreign parts, none will satisy them better for the trouble and expense of coming here.

NINETEENTH CENTURY MALADIES.

NEW DISEASES THAT FOLLOW IN THE TRAIN OF PROGRESSING CIVILIZATION.

As every pleasure in life brings its corresponding pain or bitterness, so it may be said that every civilized aid to existence devised for human kind develops an agency for introducing new ills to torment alike suffering flesh and the Æsculapian brain. The invention of steam locomotion, telegraph and telephone instruments, electric lighting and various time and labor-saving machines, while adding so much to public comfort and convenience, have also brought into existence curious diseases, which form interesting contributions to medical science, although less interesting and more expensive to the suffering victim. Railroad spine or railroad shock, an affection unknown before travel by rail became so common, has been a familiar malady for some time; but one more recent is railroad kidney, a disease not unlike Bright's disease, but of nervous origin, due to concussions received on railroads. There is a disturbance of the general system, especially of the functions of the kidneys, the symptoms disappearing when the sufferer leaves his regular work. The over-use of the telephone produces a curious disease, in some respects a form of asemasia, a volitional overstraining of certain powers by which we perceive spoken words when we cannot see the speaker or perceive his gestures or the movement of his lips; thus creating confusion of ideas, general nervousness and lack of self-control. Certain of the senses are developed at the expense of others, the natural equilibrium being unbalanced. Telephone tinnitus, aural overpressure, is caused by the constant strain of the auditory apparatus in persons who use the telephone continually, the ear becoming intolerant of the tinkle of the bell. The symptoms are buzzing noises in the ear, dizziness, neuralgic pains, and in some instances a sub-inflammatory condition of the membrana tympani. The telegrapher's cramp and the professional akinesia are of the same order of affections as the writers' cramp or the violinist's cramp. Electrical sunstroke is an affection that attacks those who are exposed to the intense rays of the electric arc used in fusing and welding metals; protection against this being afforded by wearing a mask of gray taffeta and gray eye-glasses. Ophthalmia photoelectrica is an inflammation of the eye in persons employed about electric lights, and is caused by looking at these brilliant lights at a short distance away. A succession of bright spots rapidly follow one another over the visual field, and at night there is inability to look at light without pain and a profuse flow of tears; the eyelids are swollen and movements of the eye painful. This lasts a few hours, and is succeeded by a feeling of painful weariness. The ordinary telescopic vision is a disease by which the visual field is limited concentrically, and the sufferer can finally see nothing except that which is directly in front of his eye; this condition being due to lack of nutrition of the retina or to some disease of the periphery. An affection of vision similar to the telescopic eye may also be produced by the action of quinine. The telescopic eye peculiar to lighthouse keepers is a thickening and enlarging of the bony walls of the orbit, caused by the persistent and repeated pressure of the end of the telescope upon the surroundings of the eye, inducing a chronic form of periostitis or ostitis; the eye gradually protruding, but not becoming myopic or astigmatic. The divers' bends is a new form of caisson disease, which attacks the victim on his return to the open air, with nervous prostration. The cavities connected with the nasal passages are obstructed, in some cases completely, while the men are at work, and in some cases extreme deafness has been induced. The sufferers often reel and stagger like drunkards, and sometimes are affected with partial paralysis. Electricity has been used with success for the treatment of this disease. Civilized indulgences and vanities have also contributed their share of the diseases that afflict the modern world. Tight shoes, by compressing the nerves of the foot, have created "Morton's toe." Then the tennis elbow and base-ball shoulder tell their own story; while chronic catarrh is in a large number of cases said to be due to cigarette throat, the result of smoking the much condemned but still favorite cigarette. Inventive genius is still at work improving the arts and sciences, and so the demon of disease, ever on the alert, will doubtless swoop down with his attendant ills to the end of time, keeping progress with the march of civilization.—*Times and Register.*

A DEPRESSED TRADE.—The diamond cutters of Amsterdam are in distress at lack of employment. Never has such a plethora been known and there is certainly no falling off in value, yet some eccentric turn of the industry in precious stones, the cutters of the continent are not in request. It is said there are 7,000 of these workmen out of employment in Amsterdam alone. One of the causes of the slackness of operation is said to be a tendency in jewelers to deal in raw diamonds instead of confining their attention to the polished gems.

THE PURE FOOD AGITATION.

THE NEW DAIRY AND FOOD COMMISSIONERS' ASSOCIATION.

The following are the Constitution and By-Laws of the above-named Organization, framed at Cleveland, Ohio, November 29, 1889.

CONSTITUTION.

NAME.

SECTION 1. The name of this society shall be the NATIONAL DAIRY AND FOOD COMMISSIONERS' ASSOCIATION.

PREAMBLE.

To establish a uniform standard for the purity of human food and drink, and to encourage the honest manufacturer and dealer and protect the consumer.

MEMBERS.

SEC. 2. Any person who is connected with the Dairy and Food Commission of any State as chief or assistant, or any person who is a member in good standing, in a State Dairy Association, who presents credentials which show that such person is especially delegated by the Board of Directors of said Dairy Association, or member of the National, or any State Board of Health; or a person appointed by the Governor of any State to represent the production of pure food in that State, may become a member of this Association by paying the sum of two dollars ($2.00) to the Treasurer.

SEC. 3. There shall be an annual fee of one dollar ($1.00). If any one shall omit paying his fee for one year his connection with the Association shall cease.

SEC. 4. Upon the recommendation of the Board of Directors, persons may be elected as honorary members by a two-thirds vote of the members present, and as such shall have all the rights of regular members, except those of voting and holding office.

SEC. 5. A person who has been a member in good standing of the Association shall become a life member without fees, upon removal or resignation from his position as chief or assistant of the Dairy and Food Commission of his State.

OFFICERS.

SEC. 6. The officers of this Association shall be elected by ballot, and consist of a President, a Vice-President, a Secretary, and a Treasurer. The above-named officers shall be elected annually, and together with three additional members elected by the Association, shall constitute the Board of Directors.

SEC. 7. The President shall preside at all meetings of the Association and of the Board of Directors, and shall perform such other duties and enjoy such privileges as by custom devolve upon him, and are enjoyed by a presiding officer. In his absence the Vice-President shall preside. In the absence of the Vice-President a *pro tempore* Chairman shall be appointed on nomination, the Secretary putting the question.

SEC. 8. The Secretary shall keep a full and just record of the proceedings of the Association and of the Board of Directors; shall conduct such correspondence as the Directors may assign, and shall have his records present at all meetings of the Association and of the Board of Directors. In his absence a Secretary *pro tempore* may be appointed.

SEC. 9. The Treasurer shall receive and hold in safe keeping all moneys paid to the Association: shall expend the same in accordance with the orders of the Secretary, countersigned by the President. He shall render an account to the Board of Directors prior to each meeting of the Association.

SEC. 10. The Board of Directors shall have power to fill all vacancies in their own body. Shall have in charge the general interests of the Association. Shall make all necessary arrangements for its meetings, and shall do all in their power to render it a useful organization.

MEETINGS.

SEC. 11. A meeting shall be held annually. The place and time of meetings shall be determined by the Board of Directors.

SEC. 12. The Board of Directors shall hold a regular meeting at the place, and two hours before the time of the assembling of Association, and immediately after the adjournment of the same.

SEC. 13. Special meetings may be held at such other times and places as the Board may determine.

BY-LAWS.

SEC. 14. By-Laws not inconsistent with this Constitution may be adopted by a two-thirds vote of the Association.

AMENDMENTS.

SEC. 15. This Constitution may be amended at a regular meeting by a vote of three-fourths of the members present, providing the amendment was proposed the previous day.

BY-LAWS.

A representative of any industry or manufacturer of food may address any meeting of the Association with the consent of two-thirds of the members present.

A permanent organization was effected by the election of the following officers and Directors :

H. C. THOM, Commissioner of Wisconsin..*President.*
LOVEJOY JOHNSON, Pres. Elgin Board of Trade, *Vice-President.*
F. A. DERTHICK, Commissioner of Ohio..*Secretary.*
H. D. SHERMAN, Commissioner of Iowa..*Treasurer.*

DIRECTORS.

J. K. Brown, Commissioner of New York; W. J. Ives, Commissioner of Minnesota; Prof. H. A. Weber, Ohio State Chemist.

The following gentlemen were appointed a committee to report a Pure Food Bill to the Association.

Prof. W. L. Ebberman, Minnesota State Chemist; Col. Littler, President National Butter and Cheese Association; Henry Talcott, Assistant Commissioner of Ohio.

The Bill reported by the above Committee was published in the last issue of the AMERICAN ANALYST, in full.

TRADE-MARKS.

SOME INTERESTING DECISIONS BY THE UNITED STATES COURTS.

(*Continued.*)

The ground upon which Courts of Equity (independent of statute) restrain the infringement of a trade-mark is, the protection of the public against the sale of the goods of one manufacturer misrepresented as being those of another. Where it did not appear whether the public would be misled, the cause was referred to a master to report whether such was the fact.

1st Circ. (Me.), 1872, Osgood *vs.* Allen, 1 Holmes, 185; 6 Am. L. T. 20; 7 Am. L. Rev. 568.

A Court of Equity will restrain the fraudulent imitation of a package and label, notwithstanding that they do not technically constitute a trade-mark, where the public are misled by them into purchasing the goods of the imitator, supposing them to be those of the original manufacturer.

4th Circ. (Md.), 1880, 1 Fed. Rep., 24; 4 Hughes, 239; 9 Rep., 603.

Fraudulent Competition.—No one is entitled to use the sign, label or name of another, whether it constitutes a trade-mark or not, so as to deceive the public, and thereby divert from such other any portion of a trade or business established under and on the faith reposed in such sign, label or mark.

Coleman *vs.* Flavel, Sawyers R. S. R. 220.

Where a deception is practised upon the public by one who uses or imitates the trade mark of another with a fraudulent intent to recommend to purchasers an article similar in appearance to one already made and favorably known in the market, an injunction will readily be granted to restrain it.

7th Circ. (Ind.), 1849; 4 McLean, 516; 7 West, L. J., 59.

Where a manufacturer has applied a peculiar and distinctive label to designate his goods, and has used it so that his goods have become identified by it, equity will restrain another dealer from adopting and using one so similar as likely to confuse purchasers exercising ordinary caution.

Circ. Ct. (Md.), 1886, 26 Fed. Rep., 410.

The general rule is to enjoin where the imitation is so close that, by the form, marks, contents, words, or their special arrangement, or by the general appearance of the infringing device, purchasers, exercising ordinary caution, are likely to be misled into buying the article bearing it, for the genuine one.

Supreme Court, 1877, McLean *vs.* Fleming, 96 U. S., 245.

Though the mere form of a package should not be deemed a trade-mark, yet similarity in form, color, mode of tying, and wording of label, taking together, may well operate to deceive purchasers, and therefore deserves to be enjoined as a simulation of trade-mark. Form of package may be important as one element in this combination.

2 Circ. (N. Y.), 1878, Frese *vs.* Bachof, 14; Blatch., 432.

The following propositions have become settled: 1. A Court of Equity will enjoin unlawful competition in trade, by means of a simulated label, or of the appropriation of a name; as where the defendant appropriates the name of a hotel conducted by the plaintiff, or imitates his label upon preparations. The ground of interference in this class of cases is fraud.

3 Sand., 752; 21 Cal., 448; 10 Abb., Pr., 264; 28 How. Pr., 120; 2 Bosw., 1; 2 Beav., 448; 2 R. I., 566; 39 Conn., 450.

Proprietors of a trade-mark may have an injunction against competitors who sell an imitation of their trademarks sufficiently close to be mistaken for them, though the imitation extends only to the name of the place where the goods are made. In such cases, evidence that defendant intended to deceive their purchasers is not necessary; proof that consumers of the goods generally may be injured by the deception is enough.

Circuit Court (Ill.), 1885, Southern White Lead Co. *vs.* Cary; 25 Fed. Rep., 125.

An injunction should be granted if the defendants adopt their brand for the purpose of selling their goods as and for the goods of the complainant, or for the purpose of enabling others to do so, and the complainant has been injured or is likely to be injured thereby. In such case it will not be sufficient for the defendants to show that no deception is in fact practised on those with whom they deal personally; but an injunction will be granted if consumers to whom the goods are intended to be resold are or may be deceived.

Southern White Lead Co. *vs.* Cary, 25 F., 125.

Intent to Deceive and Mislead.—If the resemblance is such that not only to plainly suggest an intention to deceive, but is calculated to mislead, the public, who are purchasers of the article, and thus to injure the sale of the goods of the proprietor of the original device, the injured party is entitled to redress.

Humphrey's Specific H. M. Co. *vs.* Wenz, 14 F., 250, Labels.

Where a label is plainly copied from a former label by design, and its general effect is such as to deceive an ordinary observer, it is an infringement.

Hostetter *vs.* Adams, 10 F., 838.

(*To be continued.*)

THE DEADLY CIGARETTE.

HEROIC TREATMENT.

Down in Birmingham, Ala., recently, a fourteen-year-old boy asked a comrade, who was two years older, for a cigarette. The latter said he had none, and when the younger playfully called him a liar he shot him dead. To call a person a liar is considered a mortal offence in Alabama, but we don't think he died for that. His older and more experienced friend shot him to cure him of the detestable habit of cigarette smoking. He had doubtless remonstrated with him time and again, and urged him to give up cigarettes, but without avail, and to save him from the lamentable effects of such a practice by a boy in his teens he mercifully shot him. Still, this is only our theory.—*Texas Siftings.*

BRIEF, BUT POINTED.

Little Johnny Day lies here,
He neither cries nor frets;
He had just reached his thirteenth year—
Cigarettes.

FRUSTRATING FRAUD.

ANOTHER TRADE-MARK DECISION IN FAVOR OF MESSRS. LEA & PERRINS.

The United States Courts have again been appealed to for protection of the public against the fraud of vile imitators. A notorious gang of label imitators, known as the Levy gang, made a concerted attempt to flood the market with bogus Worcestershire sauce in Cincinnati, New Orleans, Chicago, and Boston. They had electroplates of a colorable imitation of the Lea & Perrins Worcestershire sauce label, and a bottle mould, and were just about to begin operations, when, last week, Messrs. Lea & Perrins' lawyers in the several cities above named, made such a vigorous assault upon them with a injunction and other legal batteries, that they thought discretion the wisest course, and surrendered the bogus plates. This is the twelfth or thirteenth attempt to counterfeit this label, but owing to the determined watchfulness of the American representatives of Lea & Perrins, they have all been frustrated. It costs labor and money to protect a label, but desirable goods always will be the objects of imitation.

MAYONNAISE.—The real mayonnaise dressing is simplicity itself, but unless you have all the conditions necessary to success and a clever assistant I would not advise you to attempt it, says the *Herald*. The shallow plate in which you mix it, the oil and eggs must be very cold. Delmonico uses one egg yolk for a pint of oil. Break the yolk into the dish and stir with a fork always in one direction; add the oil, drop by drop, and as you see it separates from the egg add no more until it thoroughly amalgamates. When about four tablespoonfuls of oil have been added, let your assistant, who has been dropping the oil, add a pinch of the seasonings —mustard, salt and pepper—but as you value your sauce do not by any means stop stirring, and that always in the same direction. Let him also add a few drops of lemon juice or vinegar, and continue in this order until the oil is all used.

HOW AND WHEN TO DRINK WATER.—According to Dr. Leuf, when water is taken into the full or partly full stomach, it does not mingle with the food, as we are taught, but passes along quickly between the food and lesser curvative toward the pylorus, through which it passes into the intestines. The secretion of mucus by the lining membrane is constant, and during the night a considerable amount accumulates in the stomach; some of its liquid portion is absorbed, and that which remains is thick and tenacious. If food is taken into the stomach when in this condition it becomes coated with this mucus, and the secretion of the gastric juice and its action are delayed. These facts show the value of a goblet of water before breakfast. This washes out the tenacious mucus, and stimulates the gastric glands to secretion. In old and feeble persons water should not be taken cold, but it may be with great advantage taken warm or hot. This removal of the accumulated mucus from the stomach is probably one of the reasons why taking soup at the beginning of a meal has been found so beneficial.

NEW BOOKS.

THE PSYCHOLOGY OF ATTENTION. By Th. Ribot, Professor of Comparative and Experimental Psychology at the College of France. Authorized Translation. Chicago: Open Court Publishing Co.

A celebrated French critic has characterized the monograph of M. Ribot upon the Psychology of Attention as the most remarkable production of the philosophical press of France for the year of 1889. M. Ribot, who, in his own country, may be regarded as the inaugurator of modern psyolcgical research, is the editor of the foremost philosophical review of the continent, the *Revue Philosophique*. His works upon the Diseases of Will, of Memory, and of Personality, are universally known. The investigations of M. Ribot are confined, in the present work, to the *mechanism* of attention. And first of spontaneous attention, the mechanism of which is a mechanism of motion; it is a motion of the muscles. That which, in general, is regarded as manifestation of attention is in reality its indispensable fundament, as, for instance, the phenomena of respiration, the movement of the muscles, the face, etc.; attention, in fact, is nothing more than the subjective aspect of the physical manifestations that express it. M. Ribot then proceeds to Voluntary Attention, which is a product of art, of education, of civilization; he shows that voluntary attention acts upon muscles and through muscles only, and investigates the so-called phenomena of inhibition or the arrest of movements; he examines into the genesis of general ideas, points out the tendency to motion in them, and finally deals with the feeling of effort we experience in being attentive. Lastly, he discusses the morbid forms of attention—the most interesting chapter of the book; treating of distraction, hypochondria, the manifold and fantastic forms of fixed ideas, crotchets, notions, etc., ecstasy, with historical illustrations, attention in maniacs and idiots, and attention during sleep and during hypnosis. The subject of the mechanism of attention, hitherto, has nowhere been treated of with fullness and scientific accuracy; it has received at the hands of psychologists but cursory mention, and, practically, been neglected. It has been the object of M. Ribot to fill this gap.

HISTORICAL ERAS.

HOW ALL NATIONS IN ALL AGES HAVE COMPUTED TIME.

The Era of the OLYMPIADS, named from the games that occurred every fifth year at the city of Olympia, in Elis, is the most ancient and celebrated method of computing time. It was first instituted in the 776th year before Christ; and consisted of a revolution of four years. The first year of Christ is usually considered to correspond with the first year of the 195th Olympiad. The computation by Olympiads ceased after the 305th Olympiad, in the year of Christ 440. The Era of ROME begins with the foundation of that city, which it is pretty definately ascertained occurred in the year B. C. 753. The CHRISTIAN Era commenced on the 1st day of January, in the middle of the fourth year of the 194th Olympiad, the 753d of the building of Rome. This era was first used about the year 527 by Dionisius, a Roman abbot. It was not adopted in Italy until the sixth century; and though first used in France in the seventh, it was not universally accepted there until about the eighth century. In England it was adopted in the eighth century, and the Council of Chelsea, in July 816, directed that hereafter bishops should date their acts from the year of the incarnation. In Spain the Christian era was not uniformly used in public instruments until after the middle of the fourteenth century, nor in Portugal until about the year 1415. In the Eastern empire and in Greece, it was not universal until after the capture of Constantinople, in 1453. The JULIAN Era was the reformation of the Roman calendar by Julius Cæsar, who ordained that the year of Rome 707 should consist of fifteen months, forming altogether 445 days; that the ensuing year, 708, should be composed of 365 days; and that every fourth year should contain 366 days. Julius Cæsar also divided the months into the number of days they at present contain. An error prevailed for thirty-seven years after the death of Julius Cæsar, from reckoning every third instead of every fourth year a leap-year, as if the year contained 365 days and 8 hours. When this mistake was detected, thirteen intercalations had occurred instead of ten, and the year consequently began three days too late. The calendar was, therefore, again corrected; and it was ordered that each of the ensuing twelve years should contain 365 days only, and that there should not be any leap-year until A. U. C. 760, or A. D. 7. From that time the years have been thus calculated, with modifications that will be noted further on, and the Roman year has been adopted by all Christian nations, though after the sixth century, it became usual to date from the birth of Christ. The INDICTIONS were cycles of fifteen years, instituted by Constantine, A. D. 312, and which took the place of the Olympiads. This system of computation was much used in the ecclesiastical chronology of the middle ages, in France, Germany, England and Italy. After the twelfth century the Indiction was rarely mentioned. The ALEXANDRIAN Era of the creation of the world was fixed at 5502 years before Christ; so that A. D. I. corresponds with the Alexandrian year of the creation 5503. This computation was continued until the year A. D. 284; but in A. D. 285 ten years were subtracted. The Era of ANTIOCH fixed the creation at B. C. 5492. After 285, however it coincided with the Alexandrian era. The Era of CONSTANTINOPLE, which was adopted in that city before the middle of the seventh century, likewise commences with the creation of the world, which is assigned to B. C. 5508. The Russians followed this calculation until the reign of Peter the Great, having received it from the Greek church, by which it is still used. The GRECIAN Era commences in the year of Rome 442, twelve years after the death of Alexander, B. C., 311. This era is still in use among almost all the people of the Levant. The Jews, when they became subject to the kings of Syria adopted it; and did not abandon it for the one now used by them until within the last 400 years. By the Arabs it is still used. The CÆSAREAN Era of Antioch was instituted in consequence of the victory of Pharsalia, gained by Julius Cæsar in the year of Rome 706, and B. C. 48. The Era of PISA, which was used in France in the twelfth century differed from our common era merely by preceding it by one year. The Era of SPAIN began at the conquest of that country by Augustus, B. C., 38. It was adopted in Portugal, Africa and the southern provinces of France. The era of Spain was abolished in Catalonia, in 1180; in Aragon, in 1350; in Valencia, 1358; and in Castile, in 1393; but it prevailed in Portugal as late as 1415, or 1422. The Era of DIOCLESIAN dates from August 29th A. D., 284, the day when Dioclesian was proclaimed emperor. In consequence of his persecutions it is also called the Era of MARTYRS. It was generally used by Christian writers until the introduction of the Christian era, in the sixth century, and it is still used by the Ethiopians and Copts. The Era of THE HEGIRA dates from the flight of Mahomet from Mecca to Medina, on the 15th or 16th of July A. D. 622. The Era of ABRAHAM began October 1st B. C. 2016. The Era of NABONASSAR began February 26th B. C. 747. It continued until the death of Alexander the Great, and was thence brought down to the reign of Antonius Pius. The Era of TYRE began B. C. 125, in the year of Rome 628, and in the 186th of the Seleucidae or Grecian Era. The ACTIATIC Era was founded on the battle of Actium, which rendered Augustus master of the Roman Empire, on the 2d or 3d of September A. U. C. 723. The Romans began this era on January 1st, A. U. C. 724. In Egypt it began in the same year as the battle, August 29th, and prevailed until the reign of Dioclesian. The Greeks of Antioch began this era on the 1st of September, and it continued to be used by them as late as the ninth century. The Era of AUGUSTUS began in the year of Rome 727, twenty-seven years before the Christian era. The ARMENIAN Era began A. D. 552, the period when the Armenian Council confirmed the condemnation of the council of Chalcedonia, which was pronounced in A. D. 536. It continued in use until about 1330, when the Armenians became reconciled with the Latin church, and adopted the Julian year. The PERSIAN Era began on the accession of King Yezdegird to the throne of Persia, June 16th A. D. 632, The Persian year was readjusted in A. D. 1075, and the system continues to the present time. The JEWISH Era was adopted in the fifteenth century. The Jews date from the creation of the world, which they consider to have taken place 3760 years and 3 months before the commencement of the Christian era. The CHINESE Era begins B. C. 2277, but since the year 163 B. C. Chinese writers have dated the year from the accession of the reigning emperor. Chinese chronology, however, embodies numerous complicated features. The HINDU Era is similarly complicated and its elucidation has given rise to much controversy. The current era—the fourth—of the world's existence, the Kali yug, began B. C. 3101. The FRENCH REPUBLIC Era began September 22d, 1792. The Republican Calendar was first used on the 26th of November, 1793, and was discontinued December 31st, 1805 when the Gregorian was resumed. The foregoing are the most important historical eras in which the readers of the AMERICAN ANALYST are likely to be interested. There are others, relating to various celebrated individuals, such as the Calendar of the Positivist School founded by Comte, but all these are limited to the use of their respective followers. John Morris, of this city, the president of the Eccentric Club, has suggested the adoption in this country of the AMERICAN Era, to begin at the year 1776. According to that scheme the World's Fair of 1892 would be held in 116 A. I. The subject thus cursorily discussed is, in fact, of extensive proportions sufficient in all its ramifications to form a volume. Its most important features of historical significance, however, have been condensed in this article, and it only remains to explain briefly the system by which in modern days the divisions of time are constructed, known as the Gregorian Calendar. The Roman leap-year mentioned above in relation to the Julian Era was called bissextile, because the month of March contained two days each called the sixth day of March. This extra day in time began to be added to the end of February. The first month prior to Cæsar's time was March, and hence September was the seventh month, October the eighth, November the ninth, and December the tenth, as the names imply. We have retained these names, although they have lost their former significance. The average Julian year, however, was in error. In consequence of being too long it gradually fell behind the true year. In the time of Pope Gregory XIII. the variation of the Julian year from the true year, amounted to ten days. Gregory rectified the calendar, and immediately all the Catholic countries abandoned the old style (O. S.), as it is called, and adopted the new style (N. S.). This is the rule proposed by Gregory: The years are denominated from the birth of Christ, according to one chronological determination of that event. Every year whose number is not divisible by 4, without a remainder, consists of 365 days; every year which is so divisible, but is not divisible by 100, of 366 days; every year divisible by 100, but not by 400, again of 365 days, and every year divisible by 400 again of 366 days. Therefore in every 400 years there will be three days less than in the old style, for there are three of the century years by the new style common years, which under the O. S. would have been leap years. The change from the old to the new style took place after the 4th October, 1582. Ten days were omitted, and the day which under the O. S. would have been 5th October, 1582, under the N. S. was called 15th October, 1582. Protestant countries did not immediately adopt the N. S., but they have gradually all fallen into line. The countries in which the Greek Church is the established religion still adhere to the O. S., and their year is now twelve days behind the year of the N. S.

NATIONAL FISH CULTURE.

WHAT THE UNITED STATES FISH COMMISSIONERS ARE DOING.

In an official report which Col. McDonald, the government Fish Commissioner, is preparing for publication, considerable space will be devoted to considering the special claims of the carp. This fish is an immigrant, an assisted one at that; sixty-five of the family were brought over at Government expense from Bohemia in 1876, and already the carp—through the reproductive efforts of these original pilgrims—has become one of the most plentiful and widely distributed food fishes in this country. In some States of the Union the business of propagating carp artifically has grown to be an important industry—for example, in the vicinity of Denver, Col., where they are raised by thousands to marketable size in the reservoirs constructed for purposes of irrigation. All over Germany the rearing of carp as a food supply has been prosecuted for ever so long on an enormous scale. One place Colonel McDonald mentions where he found five thousand acres devoted to growing this kind of fish for the Hamburg market. Carp in the fatherland are looked upon as a product of the land just as much as corn, wheat or potatoes; they are even concerned to an important extent in the rotation of crops; for the farmer, having devoted certain of his acres for a term of years to an overflow produced by damming a stream—thus being enabled to maintain a carp pond—destroys the dam as soon as he finds that the fish are begining to do not very well, drains off the water and ploughs the freshly-exposed soil for the planting of vegetables. According to the demand the carp are drawn from the ponds and sent to the fish dealers who sell them alive. The consumers pick out the fish they want, swimming around in the tanks, and the dealer either kills them and has them delivered dead, or wraps them in damp cloths, putting a scrap of bread soaked in beer into the mouth of each, so that they may be killed like chickens upon being received. Of course they are not good to eat while they are spawning, and so, in order to prevent their being unsalable at any season, a number of pike-perch are put into each pond to keep the carp continually stirred up and annoyed to such an extent that excitement will dominate the instinct of reproduction, and they will not spawn at all. To eat the minnows which otherwise would fatten upon the food intended for the carp, black bass, imported for the purpose from America, are placed in the German ponds. A certain number of the fish are planted by the carp-farmer to each acre of a pond newly stocked, just as so many seeds would be sown, and the result in the shape of marketable produce is figured upon with equal exactness. The work which the Fish Commission has long regarded as the most important of all, however, concerns shad. Its labors in behalf of that fish were begun in 1880, when the shad fisheries were threatened with exhaustion; and, owing to their efforts, the yearly catch of shad has been doubled within the last nine years. At present the commission is supplying the shad-producing waters in this country with 150,000,000 newly hatched shad annually. In 1880 the shad was unknown on the west coast of the United States; 300,000 "fry" altogether were sent out there—or about as many as would be used to plant a single tributary of the Potomac, and already the shad has become a common fish in the States bordering on the Pacific. It has made its way steadily northward from Sacramento River, where it was originally introduced, until at last accounts it had reached Alaska, still on its way in shoals toward the North Pole. In the East the great shad propagating grounds used by the Fish Commission are the Susquehanna, Potomac, and Delaware Rivers. The eggs needed for hatching are all taken from fish caught for market. Fishermen are paid at the rate of $20 a million for eggs, which are either taken by the Commission's own men or by the fishermen themselves. As the fish are taken from the nets the operators pick out the females and by passing their hand over them expel the roes, the eggs being emptied into glass jars. The milt from the male fish is poured in like manner upon the eggs, to render them fertile, and that is all there is to the business. By expert hands it can be done with surprising rapidity. So as to save expense, the Commission has done its best to educate the fishermen of the Potomac to do this work themselves, and with such success that now more than half of the eggs derived from the Potomac are obtained and delivered, ready impregnated, by the fishermen, who find no small profit in this new application of their industry. The average shad yields 25,000 eggs. Of course a roe shad does not sell for quite as much without the roe. The Commission, upon receiving a batch of eggs, places them in jars through which water constantly flows, and within twenty-four hours all the bad eggs and other refuse have been washed away; if those remaining are fertile—that is, in condition to hatch out—their good condition will be apparent under the microscope, and thereupon they are measured in graduated receptacles and paid for. The eggs in the jars, continually agitated by a current of water intended to simulate the flow of a natural stream, hatch out in from four to twelve days, according to temperature. Either the eggs are shipped on the Commission's cars to various points for distribution—frequently being hatched while in transit—or they are first hatched out and the new-born fish put into the rivers. The bulk of the shad distribution is in the shape of fry. Some shad are grown to finger-lengths before being let loose, being brought up in a six-acre pond near the monument. The next fish of importance, from the Commissioner's point of view, is the white fish of the Great Lakes, and, so far as it is concerned the work is directed mainly to the keeping up of the supply, which would otherwise be quickly depleted by the fisheries. Eggs are taken from the fish newly caught, as with shad, many being brought in by fishermen. They are transferred to the hatcheries at Sandusky, Northville, Alpena and Duluth, for turning into fry, which are let loose in the waters. A new and superb station is being erected by the Commission at Put-in Bay, at the head of Lake Erie, where in future will be done all the collecting of the requisite eggs from that great spawning-ground, for distribution to the hatching stations. As for the salmon, the work of the Fish Commission is directed to the keeping up of the fisheries of the New England rivers and to the maintaining of the great commercial fisheries of the Pacific. In Maine there are two kinds of salmon to be looked after—the Penobscot salmon that comes up from the river each year, and the landlocked salmon, which is only found in a few of the Maine lakes. Up to within two years of the present time, the attention of the Commission has been devoted to the hatching and distribution of fry; but now it has gone into the business of raising salmon. Last year ninety-two thousand such fingerling Penobscot salmon were planted, as well as a great number of the landlocked variety, not to mention millions of eggs distributed among the State commissions and elsewhere. On the west coast thirteen million salmon fry a few weeks ago were distributed in the twelvemonth, the salmon required for eggs being arrested in their passage up the streams by "racks," which permitted the water to flow through, but detained the fish. The McCloud River station keeps up the supply of salmon in the Sacramento and its tributaries, while the station on the Clacquemine River provides for the Columbia River basin; and thus the west coast is supplied with salmon. For the propagation of cod the main station is at Gloucester, Mass. Last year sixty million cod fry were thrown into the waters at ebb tide and carried out to sea. Of course most of these young cod, as is the case with all fry, are gobbled up before they have a chance to grow; but the Commission estimates that it is supplying the loss by fishery depletion if three per cent. of the fry distributed arrive at adult age. The station at Wood's Holl, Mass., has devoted much attention to the study of the life-history of the cod. The trout propagated by the Fish Commission are mainly intended for distribution in the Rocky Mountain region, to which they are apparently best adapted. Not only the trout of the east coast, but also the trout of the west coast of the United States—the two quite different fishes—and even the European trout, expressly imported, are reared by the Commission. The European trout is not so pretty as the American variety, but much more gamey; it will never rise to a fly that has touched the water long enough to be wet. The great station for trout-hatching is now in process of construction at Leadville, Col. The Commission has been distributing 220,000 yearling trout annually. An industry which the Fish Commission has only recently developed, concerns the collection of the indigenous fishes of the Mississippi Valley, which, after the floods, are annually left in overflow ponds on the lowland, where they must die when the water dries up. But the agents of the Commission draw those ponds with seines, select the breeding fish of such varieties as the bass, the rock-bass, the pickerel, the perch, and the spotted cat-fish, and, conveying them to the railways, ship them all over the interior States. The fish not desired are thrown back into the rivers. Thus these overflow ponds are made to serve as natural hatching-grounds, very economically.

CRIMINAL CHRISTIAN SCIENCE.

A GRAND JURY TAKES THE SUBJECT IN HAND.

In Syracuse, N. Y., January 15th, the Grand Jury of Onondaga County made this presentment against Christian Scientists and Faith-Cure Healers:

Whereas, It is notorious that in the city of Syracuse there are many persons engaged in the practice of medicine who have in no manner complied with the statutes of this State; and

Whereas, By such practice the health and welfare of our community is greatly imperilled; be it therefore

Resolved, That it is the opinion of the Grand Jury that the District Attorney of this county owes it as a duty to the people to request the aid of the medical societies of the city and county in searching out all such illegal practitioners, as the laws of the State provide.

There have been several deaths in Syracuse recently traceable to the neglect of proper medical attention consequent on belief in these irrational methods. The evil has ceased to be an absurdity, as at first, and demands summary treatment for its extinction.

FIVE WAYS TO CURE A COLD.—1. Bathe the feet in hot water and drink a pint of hot lemonade. Then sponge with salt water and remain in a warm room.

2. Bathe the face in very hot water every five minutes for an hour.

3. Snuff up the nostrils hot salt water every three hours

4. Inhale ammonia or menthol.

5. Take four hours' active exercise in the open air.

The *Medical News*, which recommends the above, says that summer colds are the worst of all colds oftentimes, as it is then very difficult to protect one's self properly. A ten-grain dose of quinine will usually break up a cold in the beginning. Anything that will set the blood actively in circulation will do it, whether it be drugs or the use of a bucksaw.

GRAKRUT, A NEW SWEDISH EXPLOSIVE.—A Swedish Engineer, J. W. Skoglund, has invented a new explosive, which has been accepted for trials at the fleet. According to the official reports, the gray powder has been used with 25 milimeter as well as with Nordenfelt's machine guns. The former, with 70 per cent. of the new powder against 100 per cent. (or the usual charge) of ordinary powder, gives 33 per cent. greater initial velocity, without the pressure in the gun being increased more than 5 per cent. With 62 per cent. (ordinary charge weight) of gray powder, the initial velocity was increased 24 per cent. without any perceptible increase in pressure. With a change of 74 per cent. (ordinary charge weight) the intitial velocity was increased 40 per cent. without the gun being subject to any undue pressure. With regard to the important question of smokelessness, the report states that while with Nordenfelt's machine guns smoke of ordinary powder remains for twenty-five seconds, the gray powder only leaves a transparent steam, which is only visible for five seconds.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

January.

MEAT.—Beef, mutton, pork, veal.

POULTRY AND GAME.—Chicken, duck, turkey, geese, rabbit, hare, partridge, pheasant, wild fowl, pigeons.

FISH.—Brill, carp, cod, eels, salmon, whiting, haddock, oysters, lobsters, smelt.

VEGETABLES.—Brocoli, beet, cabbage, carrots, celery, onions, parsnips, turnips.

FRUITS.—Apples, pears, oranges, bananas, lemons, nuts.

PRACTICAL RECIPES.

CANNED PEA SOUP.—Mash a can of peas through a colander and add them to a quart of milk that is boiling over the fire. Season with pepper and salt and thicken with four teaspoonfuls of flour rubbed in an ounce of butter. Serve with croutons.

CROUTONS.—Cut some baker's bread into thin slices and butter them slightly; cut them into dices and bake to a light brown in a rather slow oven so that they may become thoroughly dried.

SWEETBREAD PIE.—Cut some sweetbreads which have been parboiled, into two or three pieces and let them stew for fifteen minutes in a little white stock, with a small white onion chopped fine, a piece of butter rolled in flour, pepper and salt to taste, and a dozen mushrooms. Put them into a pie dish with some asparagus tops, forcemeat balls, and hard boiled eggs. Lay slices of bacon on the top; bake until the paste is done enough.

VANILLA CREAM BLANC MANGE.—Pour a little warm water over an ounce of gelatine and let it dissolve over the fire. Sweeten a quart of cream, flavor with vanilla and whip it light. Strain the gelatine on the cream, wet molds with cold water, fill them with the cream and set in away to get cold.

TO SERVE COLD ROAST BEEF, chop the beef up finely and put a layer of the beef and a layer of stewed tomatoes, then a layer of cracker dust, and put in alternate layers of each until all is in; season with salt and pepper and bits of butter and then put a layer of cracker dust over the top; add a little water and bake a nice brown on top.

RICE MUFFINS.—One pint sifted flour, two heaping teaspoonfuls Horsford's baking powder, and a little salt. Thoroughly mix together; then add one cupful cold boiled rice, two eggs, one tablespoonful butter and enough sweet milk to make a thick batter. Bake immediately.

PIGEONS WITH RICE AND TOMATOES.—Sautez a couple of pigeons in butter; peel three large good tomatoes, cut them in four and add to pigeons. While they are cooking fry in butter two minced onions until they are brown, then add two tablespoonfuls picked rice; warm this for two or three minutes, then add a pint of clear bouillon and let it cook for twenty minutes. Take out the pigeons and add the rice, and serve.

OYSTER MACARONI—Lay a layer of macaroni straight in a baking dish, sprinkle over it pepper, salt and bits of butter, then add a layer of oysters. So alternate until the dish is full. Mix some cracker dust with an egg and spread over the top and bake.

LARGE CAVES.—Two caves capable of holding 200,000 men each have just been discovered in Australia.

THE MILD WINTER.—Grasshoppers, as lively and contented as in harvest time, were to be seen last week in Manheim, Pa., and Wellsburg, W. Va.

FRYING.

AN IMPORTANT BRANCH OF COOKING IMPERFECTLY UNDERSTOOD.

Frying is an important part of the cook's art, and frying is just the thing that in a good many pastry cooks, where dinners, etc., are provided, is done particularly badly. The following hints are taken from a contemporary: When fat is hot enough to fry with, it is at a temperature between 345 degs. Fahr. and 400 degs. Fahr., and closes the pores and carbonizes the exterior of the object, so that no fat is absorbed. The directions herewith are for frying by the first process. Use a pan large enough, so that the fat—lard or oil—will immerse the article to be fried. If you use the wire basket, made for lifting articles out of fat without piercing them with a fork, it is necessary to set the basket into the fat before it is heated. If you set the cold basket containing cold food into the heated fat there will be a sputtering sufficient to throw the food over the stove; the fat will also be cooled below the frying point. Fried articles should be laid for an instant on warm blotting paper when they are taken from the fat, that any adhering fat may be absorbed. A great deal of fish and other kinds of food is badly and wastefully cooked in consequence of the prevalence of a false theory of frying. It is evident that many domestic cooks (not hotel or restaurant cooks) have a vague idea that the metal plate forming the bottom of the frying pan should directly convey the heat of the fire to the fried substance, and that the bit of butter or lard, or dripping put into the pan is used to prevent the fish from sticking to it, or to add to the richness of the fish by smearing its surface. The fact is, that the melted fat cooks by connections of heat, just as water does in the boiling of meat. The fish, etc., should be completely immersed in a bath of melted fat or oil, and the turning over demanded by the greased-plate theory unnecessary. Well-educated cooks understand this distinctly, and use a deeper vessel than our common frying-pan, charge this with a quantity of fat sufficient to cover the fish, which is simply laid upon a wire support or frying-basket, and left in the hot fat until the browning of its surface, or of the flour or bread-crumbs with which it is coated, indicates the sufficiency of the cookery. At first sight the deep fat-bath appears extravagant, as compared with the practice of greasing the bottom of the pan with a little daub of fat, but you can easily prove the contrary by cooking a weighed quantity of any kind of fish or cutlet, etc., in a weighed quantity of fat used as a bath, then weighing the fat that remains and subtracting the latter weight from the first, to determine the quantity consumed. If the frying be properly performed and the quantity compared with that which is consumed by the method of merely greasing the pan-bottom, the bath-frying will be proved to be the more economical, as well as the more efficient method. The reason of this is simply that much or all of the fat is burnt or wasted when only a thin film is spread on the bottom of the pan, while no such waste occurs when the bath of fat is properly used. The temperature at which the dissociation of fat commences is below that required for delicately browning the surface of the fish itself, or of the flour or bread-crumbs, and therefore no fat is burnt away from the bath, as it is by the overheated portions of a merely greased frying-pan; and as regards the quantity adhering to the fish itself, this may be reduced to a minimum by withdrawing it from the bath when the whole is uniformly at the maximum cooking temperature, and allowing the fluid fat to drain off at once. It may be supposed that by complete immersion of the fish in the fat-bath more fat will soak into it, but such is not the case; the water amid the fibres of the fish is boiling and driving out steam so rapidly that no fat can enter if the heat is well maintained to the last moment, and the frying not continued too long. When cooked on the greased plate, one side is necessarily cooling and the fat settling down into the fish to occupy the pores left vacuous by the condensing steam, while the other is being heated from below. The temperature of the fat-bath may be tested by the ordinary cook's method, that of throwing into it a small piece of bread-crumb about the size of a nut. If it frizzles and produces large bubbles of steam, the full temperature of frying in the hottest of fat is reached; if it frizzles slightly and only gives out small steam-bubbles, you have the temperature demanded for slow frying.—*Confectioner and Baker.*

SIGNIFICANCE OF RED.

THE ALLEGED EVOLUTION OF COLOR SENSITIVITY.

To test the theory frequently met with, that in the thirty centuries of civilization the human retina has developed a gradually increasing color perception—the homeric man seeing chiefly the red end of the spectrum, and blue coming in much later—M. G. Pouchet compared the proportion of color epithets in types of the literature of various ages. He selected (1) a very recent work of M. Guy de Maupaussant on water, (2) "Paul et Virginie," as typical of the beginning of the century, (3) Books I. and VII. of "Telemaque," for the same reason, (4) Chapters XIV. to XXII. of the second book of "Pantagruel," taken at random from "Rabelais," and (5) a short romance, "l'Ane," attributed to Lucian, (1) gave the following number of color appellations: White, 21 times; black, 14; gray, 3; brown, 4; all kinds of reds, 23 (including pure red—15); yellow, 5; green, 6; varieties of blue, 17 (in which pure blue occurs 12 times); and violet, 3 times; in all, 96 times. Taking only the primary colors, we have red, 26; blue, 17; green, 6; yellow, 5; and violet, 3. (2), though more extended a work than (1), gave the following: White, 13; black, 15; gray, 1; varieties of red, 11; varieties of blue, 7; of green, 8; yellow, 1; or red, 11; green, 8; blue, 7; green, 2; blue, 1. (4) gives black; white, 3; red and varieties, 7; green, 2; blue, 1. (5) gives but one name, red. The result is that writers show a marked tendency to describe red things, and this tendency holds good for all times. If we survey the color impressions to which the retina is exposed, we find, first, a general brightness involving all colors—the blue of the sky, the reds of sunrise and sunset, the whites and grays of clouds; words expressive of these abound. Considering next colors in which whiteness does not enter, we find that a true violet is extremely rare in nature. Blue, too, is little fitted to be physiologically conspicuous as it presents itself in nature. Yellow is more extended, especially on flowers, but it loses its individuality in a general whiteness. There remain green and red. The reason why red has acquired so striking an effect is, that, owing to the preponderance of green, the red is conspicuous by contrast. Again, red, as the color of the blood, as the symbol of fire, as the color first and most sought after in dyes, would soon acquire a moral and intellectual prominence that would lead to its frequent mention. The proper conclusion, then, is not that our ancestors were unable to see blue and its allied shades, but that they followed the natural tendency to describe what was prominent, and this coincides with the red.—*Science.*

NATURE'S MINING LAW.—There is a law running through all nature which is as unchangeable as the laws of the Medes and Persians, though half of the men who engage in mining appear to forget the fact. They appear to think that mining is a mystery—something outside of nature—something that is not governed by any law but the law of chance, and that he who shuts his eyes is just as likely to win as he who proceeds carefully, methodically and skillfully. The fact is that nature never works by chance. Every deposit of ore that exists or ever did exist, was made in accordance with a law that is just as unchangeable as the law which prevents figs from growing on thistles.—*Mining Record, London.*

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CONTENTS.

UNWHOLESOME FLOORS.

A somewhat novel subject has been under consideration by the Royal Society, England, drawn out by communications made by medical investigators showing the results of their experiments as to the effect of floor deafening on the sanitary condition of dwelling-houses. It is shown by these investigators that this is a frequent source of pollution and vitiation of the air of dwelling-houses. The conclusion verifies the statement made some time ago by a German chemist, namely, that there exists nowhere in nature, not even in the neighborhood of human dwellings, a natural soil so highly contaminated with nitrogenous organic substances and their decomposition products as the deafening material under the floor of dwelling-rooms. It appears that in Dundee the investigators examined various samples of the floor-deafening from several houses, and in their chemical and bacteriological examination of the specimens collected, it is shown that floor-deafening furnishes just the medium for the growth of micro-organisms, and gives off gases from putrefaction, provided the necessary factors—moisture, warmth and nitrogenous matter—are present.

COLUMBIA UNKNOWN ON THE OCEAN.

A interesting and especially instructive discussion of the advantages to be derived from a protective tariff appears in the January nnmber of of the *North American Review*, in which the Hon. W. E. Gladstone appears as the advocate of Free Trade, and the Hon. J. G. Blaine as the champion of Protection. Without inquiring here into the relative merits of the positions maintained by the two distinguished disputants there is one point brought out in the argument that arrests the attention or the American reader, irrespective of the general principles of which, with all its importance, it is merely a collateral issue. That is the contemptible attitude the United States occupy as a maritime nation. The recent Pan-American Congress has attracted wide attention to the possible advantages of a closer commercial relationship between the nations of North and South America. Take as an example the Argentine Republic which is growing with astonishing rapidity. Within the past eight years it has more than doubled its imports, and in 1888 it received 148,000 European immigrants who are engaging in agriculture and stock raising and are purchasers of just such articles as the United States need markets for. The population of its capital, viz., Buenos Ayres, is over half a million, and last year 4,727 sailing vessels and 6,288 steamers entered its harbor, but not one bearing the United States flag. There are twenty-two steamship lines connecting the city with Europe, but not one with the United States. Our mails, to reach Buenos Ayres, twice cross the Atlantic, being sent to England for transmission thence. Yet the country with which we have this slight connection is an American Republic, which last year imported $130,000,000 of manufactured goods, towards which our contribution was almost unappreciable. In similar manner Chili imports $50,000,000 annually, of which we supply less than four per cent. Then, too, Brazil has a population of 12,000,000 and a foreign commerce in 1888 of $25,000,000. Her imports last year were $120,000,000, of which we supplied only $7,000,000. In view of these figures, relating to only three nations in the portion of the world nearest to ourselves, there is great significance in the declaration of Mr. Blaine that, if "since the Civil War the United States had spent in perfecting her shipping merely the annual interest on the great sum which England has expended to protect her ocean traffic, American fleets would now be rivalling the fleets of England, as they rivalled them before the war, on every sea where the prospect of commercial gain invites the American flag. The failure of the United States to encourage and establish commercial lines of American ships is in strange contrast with the zealous efforts made to extend lines of railways inside the country, even to the point of anticipating the real needs of many sections. If all the advances to railway companies, together with the outright gifts by towns, cities, counties, States and Nation be added together, the money value would not fall short of a thousand millions of dollars. No effort seems too great for our people when the interior of the country is to be connected with the seaboard. But when the suggestion is made to connect our seaboard with commercial cities of other countries by lines of steamships, the public mind is at once disturbed by the cry of 'subsidy.' We really feel as much afraid of protection at sea as Mr. Gladstone is of protection on land. The positions of the American Congress and the English Parliament on this subject are precisely reversed. England has never been affrighted by the word subsidy, and, while we have stood still in impotent fear, she has taken possession of the seas by the judicious, and even the lavish, interposition of pecuniary aid. I have already said that the interest on the amount which England has paid for this object since she began it with great energy, fifty years ago, would give all the stimulus needed for the rapid expansion of our commerce. Let it be added that if the government of the United States will for twenty years to come give merely the interest upon the interest, at the rate of 5 per cent., on the amount which has been a free gift to railroads, every steam line needed on the Atlantic, the Pacific, and the Gulf will spring into existence within two years from the passage of the act."

DISCOURAGED GHOST HUNTERS.

The American Society for Psychical Research resolved last month to dissolve, and unite with the English society of the same name as a branch of the latter. The American society was located in Boston and was organized about five years ago. The intention was to publish its proceedings and the reports of its special committees as is done by its British model. It was expected that all persons in this country interested in subjects relating to its special investigations would join as members. But a western rival sprang immediately into existence, the Western Society for Psychical Research, with its headquarters in Chicago, and its membership diffused throughout the world, some of the corresponding members living in Canada, South America, Australia and New Zealand. The western society was no more successful however than the Boston organization, and though still nominally in existence it has not held regular meetings for the past two years. The British society on the other hand is still flourishing, and its illustrated reports, which are issued regularly and command great attention, now form quite a library. There are difficulties in supporting such a society in this country that do not exist in England. In that country there is a larger class of wealthy, scholarly persons, who have abundant leisure. Most of them live within an hour's ride of the

rooms of the society in London. The society at its organization secured means to provide fine rooms, a vault to preserve papers, a paid secretary, stenographer and artists. It started out with the intention of doing business at one stand for an indefinite time. If it heard of a haunted house it was rented and occupied by one or more of its members. It kept a sharp watch on every place reported to be visited by ghosts. Every unusual mental or physical phenomenon heard of in any part of the United Kingdom was investigated and a report made concerning it. Persons were brought from remote parts of the country to be examined, or a committee sent to visit them at their homes. The British society has had both time and money to spend in making investigations. But the two similar organizations in this country have labored under great disadvantages. Their members were scattered over a great extent of territory, and most of them were comparatively poor men, whose time was employed in business or professional duties. They had not the means to rent haunted houses, to keep a watch on ghosts, to bring from a distant part of the country persons under whose influence or in whose presence remarkable phenomena were said to occur, or to send competent men to investigate these things. Moreover, the ghost market in this country has been pretty dull for some years, with no immediate prospect of rallying.

A QUESTION OF OWNERSHIP.

It has been judicially determined by the Supreme Court of Pennsylvania, though the force of the decision is somewhat weakened by the dissent of the chief justice, that the patron of a restaurant buys all the food which he orders, and that the sale is complete when the food is placed before him. He can eat it or leave it, give it away or carry it away, just as he pleases, according to the Philadelphia *Press.* The chief justice, believing that good manners and good law are identical, dissents vigorously from the position that the uneaten remnants of food can be carried away if the surfeited guest sees fit. Hotel and boarding-house keepers will regret that the chief justice's view of the law did not prevail, for then the furtive withdrawal from the dining-table of an extra orange for refreshment between meals, or of a handful of nuts and raisins for the delectation of the children would be petty larceny and would subject the offender to indictment in addition to the frowning disapproval of the landlady.

BRAZILIAN ADULTERATIONS.

It appears from a pamphlet referred to in the *Lancet,* November 23, 1889, by Dr. Campos da Paz, of Rio de Janeiro, that the manufacture of imitations of wines and liqueurs flourishes unchecked in Rio and forms a more or less important industry. The replies, based on analyses, which were returned by the local official chemists to inquiries submitted by Dr. Campos da Paz and Dr. Freire show that extensive and systematic falsification of a kind likely to be seriously injurious to public health is practiced. Indigo-carmine, dinitrocresylate of potassium, aloes, chloroform, and the compound ethers of valeric, butyric, and caproic acid, oxalic acid, and amyl alcohol are among the ingredients used in this branch of misapplied chemistry.

JEWISH FOLK MEDICINE.

STRANGE SUPERSTITIONS OF THE MODERN ORIENTAL JEWS.

Medicine mongering of one kind and another has always been a Jewish specialty, and from the time of the Babylonian quacks, whose prescriptions may be found in the Talmud, down to the present day, the orthodox Jew has stuck to his belief in popular remedies and occult physicking with all the pertinacity of his pertinacious race. Western Hebrews have emancipated themselves more or less from these and cognate superstitious notions; but in South-Eastern Europe, and more especially in Palestine, folk medicine, as it is euphemistically called, flourishes in this nineteenth century among all classes and sections of Jews to an extent simply incredible to those unacquainted with the inner life of Oriental Jewdom. In the congenial atmosphere of Eastern ghetti, the *materia medica* of archaic and Old World quackery is still in high repute. Dogs' liver, cow heel, earth worms, hares' feet, goats' fat, live ants, human bones, roosters' wings, powdered mummy, wolves' entrails, and parings of asses' hoofs, rank high among approved remedies in cases of sickness. And if variety be, as the adage asserts, charming, then the popular pharmacopœia of the Oriental Jew may undoubtedly lay claim to that quality, since its contents range from dogs' head broth to the dew that falls upon Elijah's grave on Mount Carmel, and a stew of fishes' eyes. The chief repositories of the system of occult medicine among the Jews are the so-styled "Gabbetes," elderly persons who attend the sick and dying, and perform the last offices for the dead. There are few ills to which flesh—a Jewish flesh—is heir but they have a remedy for, whether it be a wart on the nose or a fit of colic, a low fever or a brutal husband. And when they are at fault there is always some "chosid" or "pious man" who can furnish forth an appropriate prescription or mystic formula of due efficacy. In cases of obstinate and long standing illness the grand specific among the Jews of Turkey and Palestine is the "Indolka" or "Indolkado." This is a kind of ceremony, oblation and prayer rolled into one, and a most curious sample of genuine folk medicine. The house in which the patient is lying is cleared from top to bottom, and everybody, relatives and friends included, leaves it. Even strangers living in the same court quit it for the time being. When all have gone, and the sufferer is quite alone, an elderly woman accustomed to the business enters the sick chamber, and sees that there are no religious books about, and nothing that can suggest devout thought. She then procures some wheat, barley, salt, sugar, water, honey and fat, as well as six eggs. About midnight she takes the ingredients, excepting the eggs, mixes them all together, and spreads a little round about the bed, on the threshold and in each of the four corners, repeating all the time the following formula: "I implore of you, you Masters, to have pity and compassion upon the soul of So-and-so, son of So-and-so; forgive the sin he has committed against you, and restore his soul, his strength and his health; let this honey sweeten your mouth, this wheat feed your cattle, and the salt create peace and love between you and us." She then breaks an egg in each corner, prostrates herself upon the floor and kisses it, exclaiming: "Let this soul be instead of that." The ceremony is repeated three, seven or nine nights, according as the patient recovers or no. It is an expensive remedy, the charge of the person undertaking it being twenty francs. Poor people content themselves with simply putting a little salt and water on the doorstep, and repeating the same words. In more serious cases recourse is had to the "Indolka Gedolah," a somewhat similar ceremony. The house is nicely arranged, the sick person dressed in new white garments, wax tapers are lighted, and sweet smelling spices are strewed about the chamber. At midnight a black rooster is slaughtered, and the blood is smeared upon door post and walls, while the formula, "This soul for that," is repeated as before. In some instances the ceremony is performed in every house which the sufferer has occupied in the course of his life, in order that the offended powers, to whom the disease is of course ascribed, may be properly molified. For common ailments the Jew has a wide choice of simple and inexpensive remedies. If suffering from an ordinary attack of feverishness in spring or autumn, he has only to go to the nearest stream, procure a black ant and a piece of hollow reed, and then put the ant inside the reed, securely closing both ends. He must throw this into the water, saying: "My load upon thee and thy load upon me." If this should not effect a cure, he is recommended to anoint himself with an unguent of suet soaked in the milk of a woman suckling a male child. For a bilious attack, the sufferer has to drink night and morning a tumbler of water with a live grasshopper in it. In this complaint, too, the ordinary earth worm is in high repute. It is gathered after heavy rain, roasted over a fire and pounded, and then taken in wine. If the attack culminates in jaundice, the patient takes an apple, fasting, on three consecutive mornings; with the first he swallows nine gnats, with the second six, and with the third, again, three. This is regarded as an infallible specific. Eye affections are very prevalent among the Jews of South-Eastern Europe and Syria; and those afflicted with ophthalmia or partial blindness invariably try an old recipe dating from Talmudic times, and strongly recommended by the orthodox. The sufferer goes into the street and a friend ties one end of a cord to his left leg. The other end is attached to a dog, preferably black. Seven pieces of meat, obtained from seven different houses, are then eaten by the patient, the dog is set loose, and the person performing the ceremony calls out: "Blindness of So-and-so, son of So-and-so, depart from him into the eyes of the dog." For toothache there are several infallible cures. An elderly person takes a nail and hammers it into the wall of the room, repeating the words: "Adar Gar Vedar Gar;" and then adds: "Even as this nail is firm in the wall, and is not felt, so let the teeth of So-and-so, son of So-and-so, be firm in his mouth, and give him neither pain nor uneasiness." The following formula, repeated three times, is also highly recommended: "Gadash, Galash, Galsh Yegad Ugdar Galish Gadish." The meaning of these words and their application we have never been able to discover. Some Jews who suffer from toothache go to a tree near, cut a thin slip of wood from under the bark, and put it in the hollow of the aching tooth, so as to cause blood to flow. The splinter is then re-inserted in the tree, with the words, "Dobruwetter maladik." For hoarseness and complaints of the throat and air passages, an approved prescription is to take a new plate, write on it with ink the three mystic names, compounded of the Hebrew letters, "Ain, Yod, Aleph," "Vau Teth," and "Teth, Yod, Koph;" then wash them out with wine, and after adding three grains of a citron used at the Tabernacle festival, drink the beverage. Fits, epileptic and ordinary, are treated after the following fashion: The patient's head is covered, and a pious neighbor stands by the bedside, while the "practitioner" called in recites this invocation: "In the name of the Lord of Israel, in the name of the angel Raphael, and in the name of the Hosts of Aeaqen, and in the name of the One hidden and concealed, I adjure you to quit the body of So-and-so, the son of So-and-so, to quit him at once and without doing him hurt; and if you do not go, I

curse you with the curse of the Tribunal above and of the Tribunal below, and with the curse of Joshua, the son of Nun." In cases of severe prostration and debility, pounded mummy and human bones are administered; but this is considered a very dangerous medicine, and great precautions are taken to prevent evil spirits interfering with the patient or hindering his recovery. The mummy is pounded in a mortar—or if human bones are employed, they are first calcined—and beaten up with honey and spice. The compound is then put into a new vessel, never before used for any purpose whatever, and placed outside the house, on top of the roof, over night, so that the heavy dew may fall upon it. It is then divided in nine portions and taken on nine successive nights. On the last evening, and before the medicine is administered, the sick person is washed and dressed in white garments from head to foot. And as this is considered the critical period, two men or women sit up all night in the room, in order to keep off the demons who are on the watch for their prey. If it be a man who is sick, no women is suffered to enter the house during the whole nine days. When all other remedies fail, it is sometimes the custom among Palestinian Jews to take the patient to the grave of Elijah the Prophet on Mount Carmel, and leave him there alone three days and nights. The maladies of children are quite a specialty of Jewish folk medicine. There is no complaint incidental to youth but the Jewish medicine monger has the cure at his or her fingers' ends.

TRADE-MARKS.

SOME INTERESTING DECISIONS BY THE UNITED STATES COURTS.

(*Concluded.*)

Aliens protected the same as Citizens.—Objections to a suit for a violation of a trade-mark, that the plaintiff is an alien, will not be sustained in the Courts of the United States. Alien friends are entitled to the same protection in respect to their rights as citizens.

1st Circ. (Mass.) 1844; Taylor *vs.* Carpenter, 3 Story, 458; 7 L. Repr. 437; 2 West L. J. 187; 7 Circ (Ind.) 1849; Coffeen *vs.* Brunton, 4 McLean, 516; 7 West L. J., 59.

The fact that one is an alien does not affect the right of property in a trade-mark; but that fact is a necessary allegation to establish the requisite diversity of citizenship to confer jurisdiction upon a Federal court. The acts of Congress fortify the common law right to a trade-mark by conferring a statutory title upon the owner, but "property in trade-marks does not derive its existence from an act of Congress," 100 U. S. 82. By the express terms of section 10 of the present act of Congress the common law right in trade-marks is preserved intact.

La Croix *vs.* May, 15 F. 236.

Refilling Bottles an Infringement.—If the trade-mark claimed is simply the name of an island (here Montserrat), region of country, or the like, the complainant cannot make good an exclusive title to that name, but he may have an injunction restraining the defendant from buying up complainant's bottles found empty in the market, and filling them with his own article and reselling them, as this may lead the public to believe that they are buying the article sold by complainant when actually they are getting defendant's.

Circ. Court (Mass.) Evans *vs.* Von Laer, 32 Fed. Repr. 153.

A use by another of plaintiff's trade-mark for a number of years (here 14) without objection on his part—*Held* would prevent an accounting but not an injunction.

Circ. Court N. Y. 1885, 33 Fed. Rep. 869.

New Names.—When an article is made that was theretofore unknown it must be christened with a name by which it can be recognized and dealt in; and the name thus given to it becomes public property and all who deal in the article have the right to designate it by the name by which alone it is recognizable.

17 Fed. Rep. 620; 6 *Id.* 279; Circ. Court N. Y. 1885; 23 Fed. Rep. 276.

Geographical Names.—Hence no one can apply the name of a district of country to a well-known article of commerce, and obtain thereby such an exclusive right to the application as to prevent others inhabiting the district or dealing in similar articles coming from the district, from truthfully using the same designation.

Supreme Court 1871, Canal Co. *vs.* Clark, 13 Wallace 311.

Although a party cannot have an exclusive property in the use of the name of the place in which his business is situated to distinguish a particular business or product, he will be protected in the use of it, against one who adopting the same name manufactures the same article in a different place.

Circ. Court N. Y. Fed. Rep. 149; 23 Blatch 245.

OLD SHOES.

THE VARIOUS WAYS IN WHICH DISCARDED FOOT GEAR IS UTILIZED.

An absent New Yorker of an inquiring turn of mind recently saw some rag-pickers gathering up some castaway shoes, and began to inquire what it meant. He soon learned that there was a market for these articles, and after leaving the feet they come to very honorable estate and position. He found that these pickers sold them to manufacturers of the most fashionable kind of wall paper. So he went to one of these establishments to get an insight into the matter, where the foreman made the following explanation:—"We buy, said he, all the old boots and shoes the scavangers can bring us. We pay different prices for the different qualities of leather. A pair of fine calf-skin boots will bring as high as fifteen cents. We don't buy cow-hide boots. The boots and shoes are first soaked in several waters to get the dirt off them. Then the nails and threads are removed, the leather ground up to a fine pulp, and is ready for use. The embossed leather paperings which have come into fashion lately, and the stamped leather fire-screens, are really nothing but thick paper covered with a layer of this pressed leather pulp. The finer the quality of the leather, the better it takes the bronze and old gold and other expensive colors in the designs painted on them. Fashionable people think they are going away back to the medieval time when they have the walls of their libraries and dining-rooms covered with embossed leather. They don't know that the shoes and boots which their neighbors threw into the ash barrel a month before form the beautiful material on their walls and on the screens which protect their eyes from the fire. We could buy the old shoes cheaper if it were not for the competition from carriage houses and book-binders and picture-frame makers. I don't know how many other trades use old shoes and boots, but the tops of carriages are largely made of them, ground up and pressed into sheets. Book-binders use them in making the cheaper forms of leather bindings, and the new style of leather frames with leather mats in them are entirely made of the cast-off covering of our feet."

TO CLEAN CHIMNEYS.—Lamp chimneys when smoked may be easily cleaned without water by holding in the steam of a tea-kettle. Wipe out with a newspaper and finish with a cloth. If only slightly dimmed, one application of steam is sufficient.

CRIMINAL CHRISTIAN SCIENCE.

AN INTENDED VICTIM SAVED.

The Board of Health of Matteawan, New York, having encountered a case of diphtheria that was being neglected by some faith-curing practitioners, declared an immediate quarantine, which was maintained by the police. In this manner the faith curists were shut out, a reputable physican put in charge of the case, and the child began to improve. Apparently its life has been saved by the expeditious action of the sanitary board.

PHYSICIAN, HEAL THYSELF!

Patient (at Christian scientist's office)—Is the healer in?

Attendant—Yes, sir; but she is sick to-day and can't do any business.

A MIGHTY FEAST.

THE LARGEST ENTERTAINMENT EVER GIVEN AT THE WHITE HOUSE.

The most notable entertainment without exception ever given at the Executive Mansion where refreshments were served, was that to the diplomatic corps in February, 1881, at the close of the Hayes Administration. There had passed before the President and Mrs. Hayes 7,000 persons by actual count. Of this number 4,500 partook of the lavish refreshments served. There were two large wine barrels of terrapin prepared and served. Over 1,500 loaves of bread and 150 hams were made into sandwiches. There were nearly 1,000 quarts of ice cream furnished. Nearly 400 chickens were used in salads. Over 150 gallons of coffee, and great tanks of lemonade were consumed. There were cakes and confections without stint. The steward of the household, W. T. Crump, who managed this enormous gastronomic campaign, had a small army of men and women in the kitchen. A supply of 2,500 clean plates were kept constantly on hand, and required ten dish-washers. There were seven cooks in the kitchen and fifty waiters employed in serving the guests. The actual cost of this single entertainment was $6,000, although no wines were served, which was more than has ever been expended by any President for State dinners during a whole administration. The jam was unparalleled, owing to senators and others abusing the executive hospitality by bringing as many as ten ladies on the card designed only to include the ladies of their families.

FLUORESCENCE.

HOW IT MANIFESTS ITSELF, AND HOW IT IS ACCOUNTED FOR.

A beautiful mineral occurs in various localities known as fluorite, or fluor-spar, the name being given from its use as a flux in metallurgical operations. When pure it is colorless and transparent, but often occurs beautifully colored in various tints. Whatever its own color may be, when a ray of light is transmitted through it, the crystal appears to become partially self-luminous, shining with a faint bluish light, very hard to accurately describe in words, but easily recognized after being once seen. This phenomenon, which is by no means confined to fluor-spar, is known as fluorescence. Fluorescence is due to the property possessed by many bodies of changing and increasing the length of certain waves of light, so as to render them visible to the eye. The solar spectrum, as is well known, is formed by the decomposition of white light into its component parts, of different colors and wave-lengths. Commencing with the red rays, which have the longest wave-lengths, and passing along to the violet, the wave-lengths continually decrease, until they fail to produce the sensation of light upon the eye, and are transformed into actinic or chemical rays. But the ether-waves still exist, although

invisible, and, in passing through any fluorescent substance, they are so lengthened as to be transformed into light, and cause the peculiar illumination. There are also ether-waves of the opposite, or red, end of the spectrum, which are too *long* to produce the sensation of light, and appear as heat, but there is no fluorescent substance which will shorten them into visibility. The action of such substances is always in the direction of lengthening the waves. Sulphate of quinine is a beautifully fluorescent body. If a solution of this salt is placed in the sunshine, it will glow with a bluish tint, and if a convex lens is placed between the solution and the light, the path of the converging rays in the solution is very plainly shown. This experiment forms a most excellent demonstration of the laws governing the action of such lenses upon light. Characters may be painted upon a screen with a solution of sulphate of quinine, or any fluorescent substance, and will be quite invisible by ordinary light; but if the ultra violet rays of the spectrum are allowed to fall upon them, they become visible at once. Owing to the great actinic power of these rays, a photograph of such a screen will show these invisible characters upon the finished plate. Certain mysterious "spirit photographs" have been produced in this way. Among other notably fluorescent substances are æsculine, a substance extracted from the horse-chestnut; madder, chlorophyll, common kerosene oil, and quite a number of recently-discovered hydrocarbon compounds. One of these shows the phenomena so strongly that the name fluorescine has been given to it. Some of these substances are used in photography in the preparation of the so-called ortho-chromatic plates, by which colored objects may be photographed in their proper relations of light add shade, without the disturbing effect of the varying actinic power of the different colors. Glass colored yellow by uranium is highly fluorescent, and characters traced on paper with a solution of stramonium are almost invisible in daylight, but appear instantaneously when illuminated with the flame of burning sulphur. The distance on either side of the light spectrum at which these invisible ether-waves may be found is unknown, but it must be very great. A spectrum has been obtained from the electric light six or eight times as long as the visible one, and these waves may exert a distinct influence in many ways of which, at present, we have no comprehension. They may even produce sensations in some of the lower forms of life of which we can form no conception, just as certain persons can hear acute sounds to which others are deaf. The whole subject of radiant energy—which includes light, heat, electricity, actinic force, and probably many other forms—is just beginning to be comprehended, and no one can say to what revelations the future study of the subject may lead us.—*Popular Science News.*

MEMORY FOR FIGURES.

HOW A VALUABLE FACULTY MAY BE CULTIVATED.

The memory for figures is, with some persons, natural and easy; with others it is very difficult. The former do not need to strengthen their memories in this respect so much as to discipline them, that their energies be spent only on what is important and not wasted on what is trivial. They generally excel in mathematics and as engineers, surveyors or book-keepers and accountants, or, if they have not been educated, their natural memories serve them exceedingly well, and they are able to carry accounts in their head even if numerous and complicated. The latter class need special training for the development of the memory of figures, and I know of nothing so useful for them as the study of mathematics. This may seem to many as impracticable, but I do not think so. It is not necessary to go into the study of the higher mathematics; the study of mental arithmetic and of the first principles of algebra and geometry is quite sufficient. The rudimentary books designed for beginners, where everything is so simplified as to be perfectly easy and plain, are the best. A leisure hour given to them every day, or even every other day, will not only strengthen the memory of figures, but forms a most excellent means of disciplining the mind. In addition to this, the faculties should be exercised daily in recalling such matters as involve figures. The amounts of money spent daily for trifles or for important purchases may be written down at night from recollection. The prices for all articles in daily use in market may be held in memory as a matter of mental gymnastics. If a note is given or taken, the amount of it, the time it was given and the date of its maturity, together with the rate of interest, can be held in mind with little difficulty. The number of the street on which a friend lives; the number of the post-office box at which he receives his letters; the number of apple, peach and pear trees in your orchard, if you are so fortunate as to have one, and the number of bushels of fruit they produce yearly, together with the money for which they were sold may be used as memory lessons. The indebtedness of each State and of the various governments are also suitable subjects on which to exercise the memory for figures, and so are the times of the revolution on their axes and in their orbits of each planet, and the distance of each from the sun and from the earth. It would be a mistake, however, to load the mind with too much at first; a little each day is quite enough. If attention is paid to the subject and the pupil does not falter after a short trial, it is interesting to notice how retentive the memory for figures will at last become. Here, as elsewhere, determination and a vivid first impression are necessary. It is carelessness and want of attention that causes so many to have so weak and debilitated memories, not only for figures, but for names, dates and facts.—M. L. Holbrook in *The Office.*

EPIDEMICS AND MORTALITY.

IMPORTANCE OF MAINTAINING A CHEERFUL SPIRIT AND HOPEFUL HEART.

The large number of deaths which attend the prevalence of epidemics is not altogether due to the fatal character of the disease. It is a fact, not so difficult to explain as might be supposed, that many persons succumb to an attack at a time when numbers are sick of the same malady and not a few are dying from it who would have recovered if they had been the only sufferers. The effect of the mind upon the body is so strongly marked that the first effort of all well-informed physicians, when called to attend a person seized with any malady, is to secure mental tranquility ~~and a~~ hopeful spirit. Whatever may be said of the power of faith to cure disease and restore the sick, no one who has had any experience with invalids will deny that the want of it has left many to die who would have recovered if they had been sanguine of the result. A fright will check the action of the heart, and thousands perish annually without any organic disease simply from the shock of a sudden alarm which has filled them with terror. The power of the will to prolong life in a frail body has been so often witnessed that the medical authorities now accept it as established beyond all contradiction. And the great difficulty, not to say the utter impossibility of restoring to health an invalid who despairs of his own life, is equally undeniable. "There is nothing to build on," said an eminent physician who was called to attend a faint-hearted girl lying at death's door because of sore mental trouble. "The vital powers are wasting away," said another in a somewhat similar case, where the bodily constitution was breaking down under the strain of mind; and he added: "Medicine will do little good as the patient has no disease which it can reach." He prescribed tonics and stimulents but always shook his head as to the result. The appetite was gone, and what food was taken would not assimilate, the stomach seeming to be paralyzed with the load of grief that burdened heart and brain. There are valuable practical lessons to be drawn from these facts, and every one should apply them in his daily life. "Whatever else you do, don't worry yourself to death, if you never die," was the sage advice of the venerable Mrs. Fowner, who lived herself to almost five score years. A cheerful, hopeful spirit is a fountain of health; and "a merry heart doeth good like medicine" is more than a poetic metaphor; it is a blessed physiological truth of immense practical value. But the lesson is not of importance solely for its personal application to one's self, it is a rule for the treatment of others. The "scare" about the prevalent influenza has been aggravated all over the world by the method of discussing the subject, both in and out of the press. The peril to life was increased tenfold among the mercurial Frenchmen by the excited terms with which the disease was heralded, and in which its presence and effects were discussed after it reached the gay metropolis. The disease claimed hundreds of victims who would hardly have taken to their beds if they had not been seriously frightened as to the result by the exaggerated comments that were on every tongue and filled the columns of the papers. Had the same epidemic prevailed here without the widespread alarm with which its advent was heralded, its mortality, we verily believe, would have been in no wise remarkable. It is not a matter of mere speculation, but a sober fact which can be abundantly verified by the highest testimony, that hundreds have yielded to the ailment, and lain down to die, who would have recovered beyond all question if they had not been depressed in spirit and devoid of hope. All the instrumentalities that contributed to the public alarm have had a hand in adding largely to the death rate. While the excitement was at its height it was impossible to arrest the mischief-makers in their fatal work. But now that the worst is over the lesson ought to be laid to heart, and both the tongue and the printing press put under bonds for their better behavior. We had reported to us daily as many exciting details concerning the malady as were printed in the most sensational journals, but we refrained from their use. If every word of the harrowing accounts had been true, it would not have been wise to print them, and thus to add fuel to the flame. The daily essays upon the death rate, the comparison from hour to hour with the small number of deaths in healthy seasons, the capitalized head lines and all the sensational descriptions of the ravages of the disease, were directly calculated to increase the general fear and to render the attacks fatal. The disorder itself had a depressing effect upon the nervous system, but the terror needlessly excited, killed almost as many people as the pneumonia which in many cases followed it. We hope for more common sense on the visit of the next epidemic.—*Journal of Commerce.*

COURTSHIP BY TELEPHONE.

HOW ELECTRICITY AND PRESENCE OF MIND SECURED A WIFE.

There is a young lady living in Detroit, who for some time has been the recipient of the attentions of two young men, one a professor in the State University at Ann Arbor, and the other a traveling salesman for a New York wholesale hardware house, whose route extends through Michigan and parts of Canada. One day, last week, the New Yorker arrived in Detroit late in the afternoon, and, of course, immediately started making the rounds of the retail hardware dealers, with the laudable purpose of selling each a good stock for the winter before the representative of the rival house should put in an appearance. He had hoped to call on the object of his affections in the evening, but business was good and eight o'clock found him busy trying to induce a Woodward avenue dealer to take six dozen axes, four dozen grindstones and a half carload of wooden pails. At this stage of the proceedings a younger brother of the young lady dropped in to buy a new jackknife, and mentioned casually that the Ann

Arbor professor was up at the house. It instantly occurred to the enterprising hardware and cutlery salesman that the professor had come for no other purpose than to lay his heart at the feet of the young lady he himself adored. For a moment there was a struggle in his breast, but he speedily got control of himself and decided that he could not possibly leave the store, as the dealer was just on the point of deciding to take the pails. But the thought of giving up the lady who had been for months constantly in his mind, waking or sleeping, was unbearable. Light suddenly dawned on him. Handing the dealer a circular explaining the merits of his new double-bladed chopping-knives, he requested the use of the merchant's telephone for five minutes, stepped to it, and rang up the central office. A moment later, the telephone bell at the residence of the young lady rang sharp and decisive. The professor had been there for an hour talking pleasantly of the grand educational work they were doing in the department of fossilology at Ann Arbor. When the bell rang, the lady's father being absent (he was a physician), she excused herself and went into the adjoining room to answer it. The professor heard her step to the telephone and say "Yes," make a short pause, and say "Yes," again. Then there was a short pause, and he heard her say "Why—why—really, this is sudden." Then there was a still longer pause, and he heard her say "Yes," softly, then "Good-by," and she hung up the receiver and came back into the room. The professor moved closer to the fire and remarked that it was a chilly evening, and he thought it was going to snow, and then resumed his talk about the great work of the university. Fifteen minutes later there was a ring at the front door bell. The lady answered it, and a district messenger boy handed her a plain gold ring, which she slipped on her finger and returned to the parlor. "Miss ——," said the professor, five minutes later, "I want to ask you an important question this evening. Excuse me for putting it bluntly, but will you be my wife?" But we need not go further than this. Two minutes later the professor went down the front steps, shook his fist at the telephone wire, and took the 8:45 rain for Ann Arbor.

FIRE FROM FRICTION.

HOW SAVAGE PEOPLE OBTAIN FIRE BY THE RUBBING OF DRY STICKS.

One of the first things every child learns about fire is that certain savage races produce it by the rubbing of two sticks. Delightfully simple as the description of the process is, any one who has tried to perform the operation will certify that it is by no means an easy one, and very likely will afterward declare fervently upon oath that the thing cannot by done. Many travelers have tried, under the most auspicious circumstances—in countries where the production of fire in this manner is in every-day use, with a grinning native to choose the weapons and give a practical exhibition of his own skill—and after many joint and muscle aching experiments have given up the attempt in a state of mind bordering on temporary insanity. "We ourselves," writes a traveler, "have been successful just often enough to understand the uncertainty of the operation." In the first place, judgment is required in choosing the sticks. The immense variety of tropic vegetation furnishes many sorts that answer the purpose, but many also that will not. An expert sometimes may be long in finding two species suitable. One must be light and soft, the other heavy, of close texture, and both must be dry. Upon the heavy bit he cuts two grooves, in the form of a cross, fixes it tight—with his prehensive toes, probably—sharpens the light bit, places it in the intersections of the cross, and twirls it steadily between his palms. Gradually tinder forms, in the shape of dust, which drops down the grooves in a tiny heap on either side. If the twirling be interrupted for a second, that represents so much waste time, which must be recovered at enormous interest. If the heavy piece shifts, the tinder is displaced. But the power of originating fire in this manner with facility is not an accomplishment possessed by every one, even in the countries where the practice exists. The inhabitants of the tropics do not always depend wholly upon their two sticks; among many tribes they are nothing but a last resort. They have other methods of producing fire. A native carries in his betel box, perhaps, a fragment of hard pottery and a morsel of dry fungus. Fixing a bit of the latter in the hollow of the former, and holding it down with the thumb—in such a way that it follows the edge—he smartly strikes his box, which is bamboo, of course, just as if he were handling flint and steel. The fungus tinder is glowing in an instant. The friction methods in use in different parts of the world are various. One of the simplest is with the stick and groove—a blunt-pointed stick being run along a groove of its own making in a piece of wood lying on the ground. In Tahiti, Mr. Darwin saw a native produce fire in a few seconds, but only succeeded himself after much labor. This device is employed in New Zealand, the Sandwich Islands, Tonga, Samoa and the Radack Islands. Instead of rubbing the movable stick backward and forward, other tribes make it rotate rapidly in a round hole in the stationary piece of wood, in the manner referred to, thus making, as happily designated, a fire drill. This device has been observed in Australia, Kamschatka, Sumatra and the Carolines, among the Yeddahs of Ceylon, throughout a great part of South Africa, among the Esquimaux and Indian tribes of North America, in the West Indies, in Central America, and as far south as the Straits of Magellan. It was also employed by the ancient Mexicans, and Mr. Taylor gives a quaint picture of the operation from Mexican MS., in which a man, half kneeling on the ground, is causing the stick to rotate between the palms of his own hands. This simple method of rotation seems to be generally in use, but various devices have been resorted to for the purpose of diminishing the labor and hastening the result. The Guacho of the Pampas takes "an elastic stick about eighteen inches long, presses one end to his breast and the other in the hole in a piece of wood, and then rapidly turns the curved part like a carpenter's centre bit." In other cases the rotation is affected by means of a cord or thong wound around the drill and pulled alternately by this end and that. A further advance was made by some North American Indians, who appear to have applied the principle of the bow drill, and the still more ingenious pump drill was used by the Iroquois Indians. For a full description of these instruments we must refer the reader to Mr. Taylor's valuable chapter in his "Researches." These methods of producing fire are but rarely used in Europe, and only in connection with superstitious observances. We read in Wuttke that some time ago the authorities of a Mecklenberg village ordered a wild fire to be lighted against the murrain among the cattle. For two hours they strove vainly to obtain a spark, but the fault was not ascribed to the quality of the wood or to the dampness of the atmosphere, but to the stubbornness of an old lady who, objecting to the superstition, would not put out her night light. Such a fire to be efficient must burn alone. At last the strong-minded woman was compelled to give in. Fire was obtained, but of bad quality, for it did not stop the murrain. A belief in the peculiar virtues of fire obtained by the friction of wood has at one time or another prevailed among nations of Indo-European race, and not many years ago the obtaining of need (fire) was practiced in the highlands of Scotland. One of its principle virtues has always been considered to be its efficiency against disease.

PURIFYING BARRELS.—A New York farmer cleans phosphate barrels by building a fire of shavings or dry straw in them until they are charred all over inside; they are thus "purified as by fire," and fit to store potatoes in. Neglected beef barrels can be purified the same way; so can musty cider barrels by taking out one head.

SACCHARINE.

ITS HISTORY, CHARACTER AND PROSPECTIVE VALUE.

About nine years ago there was accidently discovered in the chemical laboratory of the Johns Hopkins University a substance which at once attracted the attention of the scientific as well as the unlettered public. In the course of the manufacture of a definite series of higher derivatives of the carbon compounds, Prof. Ira Remsen had the collaboration of one of his students, Dr. C. Fahlberg. The plan was to make all the substitution products, and to ascertain a few of their physical and chemical properties. That one on which Fahlberg happened then to be engaged was found by chance to be intensely sweet, and was subsequently named saccharine. It was shown to be from 280 to 300 times as sweet as cane sugar, and was deemed especially valuable in medicine. Sufferers with *diabetes mellitus*, by using very much diluted solutions of the chemical in their food, could once more enjoy the "sweets of life." It came highly recommended by doctors, because it was known to pass in quantitative amounts through the human body without any apparent effect on its various processes. Dr. Fahlberg shortly thereafter went to Germany and undertook the manufacture, on a commercial scale, of this anhydro-ortho-sulphamine benzoic acid or benzoic sulphinide, otherwise called saccharine, and gave it his name. At once it found quite extensive use as a medical preparation, as an adulterant, a substitute for sugar, and the like, both in Europe and, there is reason to believe, also in this country. The impure product for sale in the markets sells at about $15 per pound. Prof. Remsen, who still continues work in the same series, states in a recent article in the *American Chemical Journal*, that the commercial form of saccharine is more than one-half impure, and estimates its sweetness as but 125 times that of sugar. It dissolves readily in boiling water, and has several interesting derivatives with sweetening power. One of these has been found to be intensely sweet in the front part of the tongue, neutral in the middle, and exceedingly bitter in the posterior portion near the soft palate. The investigation with this compound is the best single proof that there exist in the tongue two sets of specific nerve fibers, corresponding to these two kinds of sensation. Thus it will be seen that there have been some advantages from the discovery and the prominence given this new substance. But this has been more than compensated by the train of evil that everywhere follows in its path. Authorities differ somewhat on this, but the weight of evidence lies both in the number and the reputation of those who condemn its use. Pflugge has shown that it prevents the action of the ptyalin ferment of the saliva, whose function is to change the undialyzable starch into soluble grape sugar; that it disturbs the gastric digestion, so that egg albumen is dissolved in its presence only after four days; that it has a deleterious influence on the pancreatic and intestinal digestion. He concludes that the substance is not a fit substitute for sugar, and must be especially injurious to diabetic patients, in whom so much depends on a good and healthy digestion. Other opinions differ slightly from this, but a variety of charges are made against it, for interference, in varying degrees, with the many kinds of fermentation and the purefactive processes that constantly go on in the human system, most of which are connected with digestion, all of which are beneficial. Brewers have found a use for saccharine, not as a sweetener, but more as a preventive of diastatic fermentation, the like of which is performed in certain parts of the digestive tract in man. These are, therefore, likely to be hindered by the adulterant in this favorite beverage. Its use has been made the subject of legislative action in Belgium, Spain and France. The Belgian Academy proclaims that it is not a food stuff, as it does not represent the nutritious value of sugar, since it seems to pass unchanged through the body; that its application as a sweetener in food preparations and drinks appears

to be followed by injury to the health; and that manufacturers are therefore warned that they must give ample notice to the consumer of its presence in articles of food. In Madrid it is called an adulterant; foods containing it are forbidden to be sold under penalty, while the article itself is heavily taxed. The French government, some time ago, put saccharine under a temporary ban as a substance possibly injurious to the health. Now it has definitely pronounced against it as a drug, food product, and adulterant, and has put an almost prohibitory tariff on its importation. Little has as yet been heard from this saccharine in public here in America, save as a chemical curiosity. But there seems to be a disposition among chemists to believe that it is extensively used. Our medical experts in the various laboratories of cities and States where adulterated articles and harmful drugs are sought out and the criminal processes of indictment begun, should direct their attention to this, which is undoubtedly a deleterious substance. The good of the country should also be consulted by the specialists in the Chemical Division of the United States Agricultural Department at Washington. Let them ascertain if the charges against saccharine be true, and, if so, let them advise that measures be taken to prevent its coming into more general use than has hitherto fortunately been the case. And if these charges should be proved, Congress should, like the authorities in France, put such a high tax on it as will prevent its importation. Dr. Fahlberg has a patent on the method of making his product in this country, and thus we shall be spared the danger altogether.—*Scientific American.*

HEALTH AND BODILY WARMTH.

THE RELATION OF CLOTHING TO THE PHYSICAL CONDITION.

The relation of animal heat to health and proper digestion is very close. Good health is never secured except by proper attention to clothing. This should be neither too heavy nor too scanty. The animal heat is too largely retained in the one case, and insufficiently held in the other. External cold, in a moderate degree, acts as a sort of stimulant through the nervous system, when it comes in contact with an exposed or thinly-clad part of the body. One of the chief causes of a chill is a sudden evaporation of the perspiration. Another is a sudden arrest of perspiration. These are largely prevented when one is clad in comfortable underclothing. The bracing effect of cold is felt when one is not too thickly clothed, and when at the same time the surface heat is in a dangerous excess. Thus "the indiscriminate use of the thick, heavy overcoat" cannot be too greatly deprecated. To this may be largely attributed the colds so common in the cold seasons of the year. Warm, thick underclothing and light outer-clothing—this should be the habit adopted. It is in the intermittent use of the heavy overcoat that dangers lurk. This is particularly true in regard to persons of sedentary habits; and such an one should ever be on his guard in this respect. He emerges from a warm breakfast-room, clothed in his ordinary winter garments, with probably warm underwear, and over all the heavy ulster or topcoat. After a short walk he finds that the sense of warmth he began with is more than maintained. He arrives at his office or place of business and off goes the overcoat, though the air of the newly-opened room may be nearly as cold as that without, and, perhaps, draughty in addition. During the day, perhaps, he travels to and fro from adjacent business houses, moving in only his house clothing. The overcoat is laid aside till closing time reminds him of the journey home. The result is that at times he is too warm and at other times he is chilled through, and he wonders how he has taken cold! The thickness of clothing must be proportioned to the degree of exercise, whether indoors or outdoors. One would not saw wood in an ulster, even on a very cold day. The wise man, however, would put it on when he had finished his job. Woolen underclothing is the best preventive against colds, catarrhs, and perhaps worse diseases due to chills; and this must be regulated according to age, sex, constitution and amount of exercise. Youth has great power of resistance to external cold, and runs many risks and often escapes scot free. But this is but exceptional. The weaker the constitution the more clothing, without being, of course, burdensome. The state of the weather has much to do with the regulation of the clothing, and so, too, the time of day. At night more clothing is required than in the day time. The bed clothing should be sufficient to ensure sleep. Certain parts of the body should be covered warmer than others, such as the chest, legs and feet. Thin-soled shoes and cotton stockings, on most persons, should be avoided, especially by women. Cold or tepid bathing of the chest, throat and feet forms an excellent safeguard. Rub until warmth of the skin is secured. More than all, when overheated from exercise, especially during the sudden changes of a New England climate, the outer clothing should never be suddenly thrown off unless in a warm room. The garment, instead, should be kept on until most of the superabundant animal warmth has disappeared. Neither should the underclothing be changed for thinner as warmer weather approaches, until the season for a judicious change has arrived. If one is too warm, put on lighter outer-wear. Inactivity requires more clothing than exercise. But every person should endeavor to practice, during every day, a sufficient amount of active exercise, to insure a natural amount of bodily heat. This is not saying that the exercise must of necessity be very vigorous or prolonged, and certainly not violent.—*R. I. State Bulletin.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

January.

MEAT.—Beef, mutton, pork, veal.

POULTRY AND GAME.—Chicken, duck, turkey, geese, rabbit, hare, partridge, pheasant, wild fowl, pigeons.

FISH.—Brill, carp, cod, eels, salmon, whiting, haddock, oysters, lobsters, smelt.

VEGETABLES.—Brocoli, beet, cabbage, carrots, celery, onions, parsnips, turnips.

FRUITS.—Apples, pears, oranges, bananas, lemons, nuts.

PRACTICAL RECIPES.

DRIED LIMA BEAN SOUP.—Soak one quart Lima beans over night; the following day boil them until tender; drain and press them through a colandar; put them over the fire with a pint of veal stock; put a pint of milk on the fire, and when it boils thicken it with two tablespoonfuls of flour rubbed into one of butter, stir until it thickens and then add it to the stock, and season with salt and pepper; let it boil up once; add the beaten yolks of two eggs and serve.

BROILED SALT MACKEREL.—Select a small mackerel (which will be more tender than a large, older one), and put it to soak over night in plenty of cold water; pour off the water and let it stand in milk two hours; then drain and dry in a napkin, brush butter, or, better still, pure olive oil, over it, and broil in a double-wire broiler; when done plunge it into hot water a moment, which swells it and makes it look fat; serve with melted butter containing lemon juice and chopped parsley.

DRIED PEA CHOPS.—Soak over night some dried peas; in the morning boil them, mash them with a lump of butter, pepper, salt and a bit of mint chopped fine; add bread crumbs and a beaten egg; stir well, form into chops, dip in beaten egg and bread crumbs, and fry till brown; serve with sliced lemon or mint sauce.

ORANGE PIE.—Pulp and juice of two oranges, a little of the grated peel, the yolks of three eggs, one cupful sugar, one cupful milk; stir the yolks with the sugar, then a tablespoonful of butter, then the juice, lastly the milk; bake with under crust only; after the pie has cooled spread it on the whites of the three eggs, stiffly frothed and sweetened; then set it again in the oven to brown slightly.

MAIDS OF HONOR.—One-half pint each of sweet and sour milk, two ounces of powdered rock candy, one tablespoonful melted butter, yolks of four eggs beaten up, and the juice and grated rind of one lemon; put the milk in a vessel, which set in another half full of water; heat them to set the curd, then strain off the milk, rub the curd through a strainer, add the butter to it and the other ingredients; make a paste with one pint of flour, two teaspoonfuls Horsford's baking powder, and half a teaspoon of salt; sift all together; wash the salt from half a pound of good butter in ice water, work half the butter by degrees into the prepared flour, and mix with a little more than a gill of ice water, or enough to make a stiff dough; roll out the paste and strew over it a part of the remaining butter divided into little pieces and dredged with flour; roll up the dough like a jelly roll, and roll it out again with the rolling pin; repeat this latter process once more, and when rolled out thin add the remaining butter; line little pans with this, fill with the mixture, and bake till they are firm in the centre.

APPLE FRITTERS.—Pare two large apples, cut them in slices half an inch thick; core them with a round cutter; put them in a dish and pour brandy over them, let them lie for two hours; make a thick batter, using two eggs; have clean lard, and make it quite hot; fry two at a time, a nice light brown; put them on the back of a sieve on paper, sift pounded sugar over them, glaze them with a shovel or salamander; dish on a napkin.

DINING AS A FINE ART.

SOME USEFUL HINTS FOR THE PREPARATION OF AN ARTISTIC MENU.

The first principles which should govern public purveyors in compiling their menus and preparing their feasts are too frequently disregarded, but by no means so often as by private dinner-givers, to whom Mrs. Fenwick Miller has been giving some useful hints in the columns of a London weekly. An artistic dinner, she truly remarks, will not be too long and complicated, but must include sufficient variety to suit all tastes. There is no question that the vast majority of Englishmen insist upon "a cut from the joint," and no entree, even if as substantial as a daintily cooked veal cutlet or stewed ox-tail, will be allowed to satisfactorily fill the place of a joint. Where game or poultry is given, however, the solid substantial slice may generally be dispensed with, provided the entree be not too light. It is a great thing in a dinner to have change of flavor in the several courses. Thus a gamey soup should not be served when pheasant or partridge is to appear later on, nor a tomato soup when the same vegetables are again used either in sauce or salad. Again, when a bland or almost sweet soup is given, such as artichoke (Palestine), or milk, or carrot (Crecy), it is very desirable to give some fully-flavored hors-d'œvure first, so that the soup may have the greater grace from contrast. Freshly opened oysters, on the half-shell ended with cut lemon, cayenne, and thin brown bread and butter—just four oysters to each person—are surely perfect for beginning a dinner. When oysters are not to be had, olives "turned"—*i. e.* stoned without breaking them, so that they close up again into their natural shape—filled with pate de foie-grass and just surrounded by aspic jelly, two or three at most to each guest, make another favorite hors-d'œuvre specially suitable to precede a delicate soup. If the soup be one with a powerful savory taste, the preliminary dish is not needed; and a strong argument for omitting it is that so many people

prefer to have the same sort of thing as an entremet after the sweets. Epicures seldom care much for the sweets. Sugar is not favorable to digestion, and, moreover, tends to increase that over-supply of adipose tissue from which so many folks begin to suffer even before they can fairly be called "middle-aged." Besides which, sweet is not merely a flavor, but a cloying of the sense of flavor; and, in short, few people who really appreciate a good dinner care much for the sweets. A vanilla baveroise, an omelette au rhum, peach or orange fritters, or some other dish of that character, which does not involve either pastry or much sugar, is generally acceptable. At least, such should be provided as some people would think they had not dined without a sweet course at all. But then, for the people who really have taste, should come the savory. Mushrooms, or caviare, or anchovies, or cheese, or what not, for the base—little substance, but sapidity and savor—a strong and well-managed taste, to give the assurance that appetite is not surfeited, and to serve as the apex of the pyramid of an artistic menu.

OPIUM IN HISTORY.

THE EARLIEST ACCOUNTS OF ITS USE IN THE ORIENT.

According to a work recently issued by the Chinese Imperial Maratime Customs, written by Dr. Edkins, and entitled "Opium: Historical Note on the Poppy in China," the Arabs took opium to that country in the eight century, at a time when there was a flourishing trade between Canton and the ports of the Red Sea and the Persian Gulf. The medicinal properties of the drug are mentioned in a work published in the tenth century. From this time it was cultivated for these properties, and from the fifteenth century "it appears plain that the manufacture of opium has existed in China and it is not until recent years that there have been both native and foreign opium in this country." The smoking of opium came in with the smoking of tobacco in the seventeenth century." Various ingredients, says Dr. Edkins, were in various countries mixed with tobacco to try their effect, amongst them being opium. The Manchus tried to prohibit the use of tobacco by edicts as stringent as those issued against opium, but in vain. Amongst the causes of this failure the writer includes the love of opium smoking by many in high position—Court favorites and others—whom it would be difficult to punish. Opium smoking began in Formosa and Amoy, where tobacco smoking was first introduced. The first edict against the practice was in 1729. Opium was a common product of Yunnan in 1736, and in those days this distant province was far remote from the influence of any foreign country whatever, except Burmah.

EARLY SHAD.—The N. Y. *Star* of Jan. 15th says: Commissioner Blackford received yesterday morning a North River shad weighing over four pounds. It was caught in the neighborhood of Fishkill. It has not been decided whether or not the Commissioner will in this instance follow the custom of placing the first shad of the season upon the Mayor's table.

NEW FASHIONS FOR DOGS.—Dogs will be worn this season cut latitudinally instead of longitudinally, as was the style last year. A beast promenaded Fifth Avenue with his mistress yesterday afternoon, which was presumably trimmed according to the very latest fashion. It was an ugly creature at best, but the clipping machine had left it a perfect monstrosity. Its color was a muddy brown where the matted curly hair had been allowed to remain. The head and shoulders had been left shaggy and leonine. The body had been shaved to the skin, except that three parallel narrow bands of hair remained encircling it a few inches apart. The legs were trimmed clear down to the lower joint of each, where a bunch of fur was left, giving the animal the appearance of walking on four sticks, with the ends thrust into balls of dirty cotton batting. The tail was bare, with a cheerfully waving tuft of hair at its tip. The woman who owned him was evidently proud of her grotesque pet. He was rigged out to attract attention, and he did.—*N. Y. Sun.*

THE WHEREFORE.

A man of modern science wooed
A maiden of accepting mood,
Who, dreading lest contagion might
Do mischief to her chosen wight,
With sol. bichloride washed her hair
And sponged her limbs and body fair.

She rinsed her mouth with "Listerine,"
And held, her snow-white teeth between,
A pad of antiseptic gauze,—
Covering her nose as well as jaws,—
Which formed a sort of respirator
Between them and her "osculator."

But this reminds,—I should have told
That these were things he'd taught of old,
With others which I may not tell, in
Regard to spots that germs might dwell in.
She was a wise professor's daughter
And practised all which had been taught her.

So this good medicine man, with pride
Clasping his antiseptic bride,—
In disinfected murmur low
Asked "why she loved her doctor so?"
And, softly nestling down, she sighed,
"You're such a dear *old germicide!*"

Boston Med. and Surg. Journal.

BUTTERING MACHINE.—The latest and most unique invention is a machine for buttering bread. It is used in connection with a great patent bread-cutter, and is intended for use in prisons, workhouses and other reformatory institutions. There is a cylindrical-shaped brush which is fed with butter, and lays a thin layer on the bread as it comes from the cutter. The machine can be worked by hand, steam or electricity, and has a capacity of cutting and buttering 750 loaves of bread an hour. The saving of butter and of bread and the decrease in the quantity of crumbs is said to be very large.

MEDICAL ANNUAL.

The 8th yearly issue of the "International Medical Annual" (for 1890) is announced for early delivery. The Prospectus gives promise of excellencies surpassing all former editions. Its thirty-seven editors in the several departments are to give a summary of New Remedies alphabetically arranged, also a resume of New Treatment in Dictionary form; with references to the Medical literature of the world pertaining to the year's progress of Medicine.

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E. B. Treat, Publisher, 5 Cooper Union, New York.

IS RHEUMATISM A GERM DISEASE.

Within a short time there has been suggested a new theory of rheumatism; it is, that it belongs to the class of infectious diseases, and like them is produced by bacteria. This is slowly gaining credence. Certainly, rheumatism frequently occurrs in epidemics, and instances are on record where it was only reasonable to assume that the disease was spread by personal contact. Edelfsen reports seven hundred and twenty-eight cases occurring in four hundred and ninety-two houses in Kiel. Pel of Amsterdam, cites the case of a patient that was removed to a bed between two others suffering from rheumatic fever. She, never having had rheumatism, was attacked with it coincidently with a relapse of the disease in five other patients. Many other observers offer similar testimony. The theory is one deserving the attention of scientists and warrants thorough experimental research to demonstrate its truth or its fallacy. The supporters of this germ-theory of rheumatism believe that the bacteria which produces that disease is taken into the blood, were it does its work. It would not be strange if this theory and the other—excess of acid in the blood—were both proved correct, and one waited on the other. Or, in other words, where the actual exciting cause of rheumatism is a germ, that germ requires certain conditions for its development, and those conditions are met and exist where the blood is deficient in alkalies, or contains an excess of lactic acid.

And now as to the prevention of rheumatism. One who has even a strong tendency can certainly do much to prevent it. The "busy season" for that disease commenced in September. Why is it? That we do not know; but it is quite safe to infer that owing to a certain combination of influences, people are then in a condition specially favorable to it. After several months of hot weather the systems of many are relaxed, weakened and more or less choked up with waste material. Exercise, the great eliminator of such waste is quite naturally neglected during the heat of summer. And, moreover, those who exercise too little are liable to eat too much. So autumn finds them in a sluggish state, as we have said, with all the eliminating avenues clogged up. This is a condition of things very favorable to rheumatism. It naturally follows that those who are subject to this disease should live abstemiously, exercise freely, keep the skin active by frequent bathing, the bowels open with fruits, and drink water in large quantities. If these few simple rules are observed there will be ordinarily but little danger of rheumatism. For those, however, who have a decided tendency to the disease, and have already suffered from it, there are much more rigid rules which it is necessary to observe to secure immunity. Both in the prevention of rheumatism and in its cure, there can be no better remedies than Dr. J. C. Ayer's Sarsaparilla, the component parts of which have been so frequently described in these columns that it is hardly worth while to say more on this point. Suffice it to say, that Ayer's Sarsaparilla cleanses, renovates, and tones up the system, and thus enables it to throw off the morbid secretions which favor rheumatism; it keeps the liver, kidneys and skin active, and places the human mechanism in the best possible condition to resist the predisposing and favoring causes of rheumatism, and, where already present, to rid itself of them.

TO REMOVE RUST.—A simple way of removing rust from finely polished steel without injury to the surface consists in cleaning the article with a mixture of ten parts of tin putty, eight of prepared buck's horn and twenty-five of alcohol, and then rubbing with soft blotting paper.

GLASS BLOWING BY MACHINERY.—Glass blowing by machinery is being performed successfully at Ellenville, New York. The machine consists of an iron upright, around which revolve arms fitted with molds for shaping the glass. A pipe supplied with a current of air and readily manipulated by the operator does the work of blowing. The machine is said to be capable of turning off 100 dozen perfect bottles a day. It costs but about $200 and will take the place of two skilled men, who command from $5 to $7 a day each. The machine is an English invention and has been in use about a year.

ELECTRICITY IN THE NAVY.—There is a proposition before Congress to appropriate $250,000 to pay the cost of experiments to test the utility of electric motors as applied to the steering, lighting and ventilating of naval vessels; for pumping and hoisting, and for handling marine ordnance and ammunition, and generally to testing the efficiency of electrical power as applied to marine architecture. These experiments are to be conducted under the direction and control of the Secretary of the Navy, who is authorized to detail officers and designate places and vessels for the work.

SUCKERS.—The word sucker, in the sense which is so familiar in this country, is an Americanism, and was formerly applied to the inhabitants of Illinois. It used to be customary for wanderers over the prairies to carry with them pieces of a long, hollow weed. The prairies were honeycombed with crawfish holes, which were pretty sure to be filled with pure water. Whenever thirst attacked the ingenious sucker he produced his tube, connected one end with the crawfish hole, the other with his mouth, and sucked. It was simple, it was ingenious, it was beautiful. It showed reliance on the providence of God and the resources of nature—but it fastened a stigma on an intelligent and progressive community, from which they will not escape for many æons. It seems, indeed, that those dwellers on the prairie, who made the very crawfish dig wells for them, and who extracted refreshment direct from the very breast of nature, showed themselves guileless and unsuspecting whenever they mingled with the inhabitants of the larger cities. So noticeable did this become that the real meaning of their peculiar name was forgotten, and people generally, whether city or country bred, whose bump of credulity was specially developed, or who had too great confidence in human nature, came to be called suckers.

HEART FAILURE.—"It would be an excellent idea," says the Manchester *Union*, "if physicians of the present day would invent some other reason for about all of the deaths which occur nowadays than the cheap fraud, 'heart failure.' This might not be of serious moment were it not for the fact that hundreds of people are being nearly frightened to death by the constant use of the cause for sudden deaths, and many people who are sick, and necessarily have some heart symptoms, are kept in constant terror by reading or hearing in other ways of death after death by heart failure. There are probably no more deaths from heart failure in these times than heretofore, but a new cause for death has been coined, and the nervous and timid are being severely injured by it." We would suggest that hereafter physicians use the term "cardiac asthenia," which has a learned sound and means just the same. The immediate cause of death in many diseases being in fact "heart failure," we do not see how otherwise the "nervous and timid" can be protected."

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CONTENTS.

WEATHER vs. MORALITY.

Our conservative and observant contemporary, the *Commercial Bulletin*, recently ventured the somewhat startling suggestion that the remarkably mild weather of the past winter in this section of the country will make fire insurance companies very cautious in regard to the "moral hazard" which the light sales of winter clothing will probably stimulate. There can be but little doubt, the writer declares, that during the next three months there will occur an unusual number of incendiary fires in stores dealing in these goods. Northern New York has proved such a graveyard of fire insurance capital, on account of poor fire protection and frequent incendiarism, that a few dozen extra fires there will not be noticed. A number of companies are scanning closely all risks, largely embracing classes of goods which will be left over on account of the light demand for winter garments; for, when the time allowed for payment has expired, the assured may prefer to burn them and get cash rather than carry them over until the next season. Fur garments have proven very unsalable this season, particularly sealskin or other cloaks. The most careful companies will decline to accept new fur risks, and simply continue the policies of such customers as are well known to them, avoiding new concerns. There is a laxity in the prosecution of incendiaries in this country which is truly deplorable, and New York City is about as badly off in this respect as any other city in the United States. The only city which has really grappled with the incendiary problem in a business-like way is Boston, which investigates suspicious fires and prosecutes incendiaries without fear or favor. The reason why so few of the many incendiaries in this city are brought to book is said to be that the appropriation for the Fire Marshal's Office is too small to admit of the employment of the necessary help. If this really be the trouble, a larger appropriation should be made, as every few days the daily papers chronicle some incendiary fire in an east-side tenement causing not merely loss of property but loss of life. In addition, there are innumerable small incendiary fires in shops on the east side, where the criminal has hazarded life in his endeavor to swindle the fire insurance companies out of a few hundred dollars. If the citizens of this country appreciated how many lives are lost and how much property is destroyed each year through fires intentionally started, public sentiment would undergo a change, and stringent measures for the suppression of this abominable crime would speedily be inaugurated. Honest men now pay much more for their fire insurance than they would need to were the companies not called on so often to pay double value for property intentionally destroyed.

PHOTOGRAPHING THE SUN.

The expedition sent out under the auspices of the government to the African coast for the purpose of taking observations of the total eclipse of the sun on Dec. 22 was a very gratifying success. Prof. David P. Todd with sixteen specialists as companions and twelve tons of scientific apparatus, set sail from New York on Oct. 16 on the United States man-of-war Pensacola. On Dec. 8 the expedition reached St. Paul de Loando in Anigola, about eight degrees south of the equator. Prof. Todd finally chose Cape Ledo as his point of observation, and the instruments were set up and put in adjustment without delay. Cape Ledo is on the Bay of Suto which is about nine miles in length, and receives the waters of a river of the same name. It appeared to be in every way the most suitable location. Not only were the meteorological probabilities better than any other possible point, but the eclipse was a few seconds longer there. The party lived principally on the Pensacola, as she lay at anchor near by, a much safer arrangement than to trust wholly to the climate ashore. The great photo-heliograph, forty feet long, pointed directly at the sun, was one of the chief instruments used. The working of the apparatus was entirely automatic, and by an application of a pneumatic arrangement, never before used in this way, the charging of the photographic plates was far more quickly and accurately accomplished than ever before, while the exact time at which each picture was made was recorded to the small fraction of a second. While the astronomers were busy with their instruments in preparation for the eclipse day, Prof. Cleveland devoted himself to the meteorology of the region. Mr. C. A. Orr studied the anthropology. Mr. Loomis made researches into the botany and ornithology, while the geology, mineralogy, osteology, biology, and all the other attributes of this far away shore were carefully studied by experts in each. The beginning of the eclipse on the 22d was entirely clear. Later clouds interfered somewhat with the view, but more than eighty fine photographs were taken, and the instruments worked without a flaw. The entire success of the new appliances was one of the most gratifying results of the expedition, since the principle upon which they worked is so completely demonstrated to be correct. The spectacular part of this eclipse was particularly gorgeous and impressive. The colors on land, sea, and sky a few moments before totality were superb, and the approaching shadow swept over the ocean toward the station with a terrifying velocity.

COUNTERFEIT WINE LABELS.

We were shown recently a bottle containing a vile decoction of alcohol, glucose and coloring matter, and bearing what purported to be and looked like the genuine label of St. Julien claret of a well-known Bordeaux wine house. This house and its agent in this city know very well that this counterfeit is being printed here and that, in fact, these fraudulent labels are being sold as stock labels to be attached to any trash the wine sophisticators choose. The imitation is so close that an expert cannot distinguish the genuine from the counterfeit. The public, of course, cannot tell. A house which has always enjoyed the public confidence and which neglects to take any steps to protect its labels from such bold imitation, does not do its duty either to itself or to its patrons and therefore must inevitably loose public confidence. There is an abundance of good St. Julien imported which bears the label of houses who carefully protect themselves and their customers, and whose importation will naturally replace that of a house whose label does not guarantee the public against being defrauded. We refrain from publishing names.

DRESSED BEEF ABROAD.

The popularity of the Chicago dressed beef extends beyond the limits of the United States, and is rapidly growing. In the Canadian House of Commons, in Ottawa, on January 24th, a member representing the Westmoreland constituency called attention to the enormous increase in the consumption of American dressed meat in the maritime provinces. Nine years ago the importation amounted to 300,000 pounds, but Chicago houses have since worked up a trade there representing nearly 4,000,000 pounds annually. That appears to be the story everywhere.

ARTIFICIAL COFFEE.

In July, 1886, the AMERICAN ANALYST published an article on Coffee, written for the paper by a Paymaster in the United States Navy, in which it was stated that imitation coffee beans were in the market, made of flour, chicory and coloring matter, and compressed into shape by machinery. These bogus coffee beans readily escaped observation, and costing only three or four cents a pound gave opportunity to adulterators to defraud the consumer, to say nothing of the poisonous character of the coloring material used. The article containing the information was loudly objected to and pronounced sensational by one of the largest coffee importers in this city. Not being able at the time to obtain sample of the fraudulent coffee thus exposed, we were unable to prove the correctness of our information but knowing it to come from a trustworthy source we refused to publish the bare denial. The following article which appeared in the *Commercial Advertiser* of January 29, 1890, conclusively proves that the AMERICAN ANALYST was, as usual, correct and its information over three years in advance of its contemporaries.

"The genius that led to the manufacture of wooden nutmegs some years ago—a genius for making money by filling one's fellow-men with sawdust, like children's dolls—has broken loose again. This time flour, water and some unknown ingredient like mucilage, take the place of wood and instead of nutmegs, coffee—genuine Rio, Java, Mocha, or any desired brand—is manufactured. The manufacture of this adulterant has been going on successfully for some time at certainly two places, Philadelphia and Trenton, New Jersey. But the originating genius may be neither a Philadelphian nor a Jerseyman. His nationality is in fact unknown and a dilligent search carried on for weeks has failed to locate the manufacture of spurious coffee beans. Some of the wholesale grocers down town have a quantity of these manufactured coffee beans. In size, shape and color they are a close imitation of the bean imported from Rio, which is so popular in the eastern part of the United States. It is a small, rather flat bean of a bluish-green, slate color tint, and rather smaller than some of the coffees that are imported into this country. The chief faults of the imitation are that it is a trifle too heavy and lacks the small fibre that is almost always seen on the flat side of a coffee bean in the little crease that almost divides the bean. Still, the imitation is pronounced excellent by experts who have examined specimens of the Philadelphia coffee. The secret of its manufacture is unknown. No analysis has been as yet made to determine all of the ingredients. It is only known that flour and water are used in making the beans. The form of the coffee bean is of course taken from a mould of an actual bean. How it is colored is a mystery. While the raw coffee is an excellent imitation, the roasted imitation is almost perfect when examined casually even by coffee experts. In color, the general appearance, everything but taste, in fact, the roasted coffee that comes from Philadelphia and Trenton is equal to any coffee in the market. It tastes like dough that has been allowed to stand a century in a retired spot, where it could not harden as dough naturally does harden after a time. Several grains of the Philadelphia coffee were taken by a representative of the *Commercial* around among the coffee brokers down town. Few of them had ever heard of it before, but pronounced it an excellent imitation. One well-known broker said, pointing to a small pan nearly full of unroasted coffee, that in color and size the made bean seemed identical with the real coffee. "Still," he added, "put four beans in that pan and mix them well with the genuine, and I'll wager a $10 gold piece I can pick them out in three minutes."

The four Philadelphia beans were placed in the pan and mixed with the genuine Rio while the broker's back was turned. Then the pan was handed to him. It contained about four hundred coffee beans. In two minutes the broker had picked out four beans. A close examination showed that one bean was genuine and three were the made beans. He afterwards found the bad Philadelphia bean in the pan. He explained his mistake by saying that he was near-sighted. The coffee representative of Thurber, Whyland & Co. said: "It's a fair imitation of Rio coffee, but an expert can see the difference easily. Its color is bad and its weight fully one-third more than the genuine article. When mixed with the real coffee, however, in its roasted form, it will pass easily. As far as I know, none of it is sold in this city, unless some reckless scamps who keep small retail stores buy it and palm it off mixed with the genuine." Another coffee dealer said: "I have heard that this bogus coffee is extensively sold in Trenton and Philadelphia, but I never heard of any being sold in this city. Whether it is made in Philadelphia or not, I cannot say, but I have heard that there is a place in Trenton where it is manufactured extensively." Several specimens of bogus coffee manufactured in Germany are also in the city now. They are larger than the Philadelphia coffee, and not such a good imitation. The Philadelphia people are supposed to be a branch of the German concern. The German product was analyzed recently and found to contain one or two dangerous ingredients used in coloring. A careful search for the coffee manufacturers has been made by the authorities of Trenton and Philadelphia backed by several influential persons in this city, with a view to putting a stop to the business. All efforts to locate the offenders, however, have failed and the scarch has practically been abandoned. One place in Trenton was watched carefully, and the offenders were probably located in it for a while, but whether they were warned or suspicious, they suddenly decamped, taking their machinery with them. The cost of manufacturing this bogus coffee is about three or four cents a pound, labor being the greatest item of expense."

HEALTH, SANITY AND DIET.

HOW FAR THE MIND IS CONTROLLED BY BODILY CONDITIONS.

It has been said that, "speaking scientifically, we cannot affirm that anybody is perfectly healthy." If the pathologist can detect the symptoms of disease in the most apparently healthy body, no less certainly can the neurologist indicate subtle manifestations in the mental states of the sanest amongst us, which serve to warn us how perilously near we may all come at times to mental derangement. Just as it is impossible to set up a standard of bodily health of universal application, so it is with the mind; one man's measure of mental health cannot be taken as that of another. "Health" and "whole" are both derived from the Anglo-Saxon term *hal*, and no one man has the completeness of either bodily or mental soundness at any one time. We may be sane (safe, sound,) but at best only relatively, and the varying moods may often be strangely like the true persistent phrases of the acknowledged alien. There are few of us who have not moments of depression or abnormal excitement, which if unduly prolonged, would make us the objects of unpleasant attentions at the hands of our friends, and not one of us can say at any time that we shall never find those unhappy moods persist. Apart, however, from any such painful forbodings, it is an interesting subject to consider some of those mental attitudes of the perfectly sane, and trace their causes to their actual source. There is a posthumous paper in the recent number of the *Neurologist*, by Dr. Milner Fothergill, which deals—in the pleasant and instructive manner for which its distinguished writer was so celebrated—with this interesting question. If we would rightly know the workings of the human mind in their varied conditions, we must study them, as the brilliant author tells us, in the insane asylum. What angry man amongst us may not find food for reflection and learn the habits of self-control from the incoherent frenzy? What garrulous, self-centred man may not be rebuked when he sees his infirmity a little magnified in the flow of the talkative maniac? The delusions of the over-sanguine, the groundless fancies of the visionary, the baseless conceptions of the jealous, the morbid religiosity of the despondent man, all find their legitimate projections in some fixed condition common enough in the dread abode of the insane, and all have lessons for us. The asylum held up the mirror to the observant eye of Dr. Milner Fothergill, showing him our natural and healthy moods when perverted by disease, mismanagement or neglect, into forms of mental disorder. A bad habit or the dominance of an unfortunate predilection may disturb the balance of an otherwise healthy mind, as effectually as the touch of a magnet on the balance wheel of an exquisite watch will impede its regular motion. How easily is our mental balance disturbed. A single serious reverse may blight a man's hopes for life, yet with another and sterner habit of thought the advancing phthisis of a Richard Jeffreys will not have the least ill effect. What a variety of moods are caused by food alone! A hungry man can scarcely be termed quite sane in comparison with one who is comfortably digesting the dinner of one of the "city companies." A cynic might turn upon us, and declare that the man who has just dined well evidences his cerebral disturbance by the ease with which a liberal subscription can be obtained from him, and that his less replete moments are his prudent and normal ones. When the Church desired to reduce us to a proper sense of our deserts and shortcomings, she bade us fast and as fasting has always been associated with penitence, it might be argued by a theologian that we are more our real selves when hungry than full. Andrew Boorde the monk-physician, in his quaint book, *The Dyetary of Health*, rather inclines to the "city company" idea of sanity, when he advises his readers to "Fyrste lyne out of syn, and folowe Christes doctrine, and then vse honest myrth and honest company, and vse to ete good meate, and drynke moderately." Shakespeare thought that the "lean and hungry" looking Cassius must naturally be dangerous, and the general testimony of English writers at any rate is to the close connection between fat folk and good temper. Dr. Fothergill was a grand example in himself, and we can picture the relish with which he wrote, "When the brain is well fed it has a sense of well being; when it is ill supplied with blood it is irritable, miserable and despondent." But alas! the very process of feeding the brain and making general contentment in the body too often vitiates the blood and as the old writers would say, "disturb the humors." The good feeder gives a standing invitation to the gout, and the gouty material in the blood makes a man "choleric," that is to say, hasty and irritable. The over-fat, amiable man has fits of "the blues," he often decends to the melancholy mood, and then, as old Burton says, "he is the cream of human adversity, the quintessence, and upshot." A disordered liver has made many a one think he has sinned the unpardonable sin, and a good purge has often lifted a burden from the conscience as heavy as that of Bunyan's Pilgrim. Dr. Fothergill thought that the atmospheric conditions of Bath and Bournemouth are distinctly answerable for their religious tone, whilst the tonic effects of Clifton have much to do with its intellectual activity. It would be interesting to compare Margate and Brighton with the special moods of their visitors; but these theories may easily be pushed too far, and we might find ourselves inquiring what are the characteristics of Monte Carlo which foster the gambling spirit, and what makes the Neapolitans so light-hearted an frivolous. Perhaps the diet has even more to do with the moods of the sane than atmospheric conditions. An old adge says that,

"he who drinks beer thinks beer," but there is beer and beer. The German philosopher stimulates his brain to the highest intellectual exercises on beer, while our working classes deaden their not over active cerebral organization on something called by the same name. Whether we are as sane as we might be in creating any sort of mood by alcohol, is extremely doubtful, for most competent observers agree that the best sorts of intellectual, as of other work, cannot be done under its influence. "The accursed hag dyspepsia," as Carlyle called it, has been answerable for a good deal of the gloomier theology of the past and present. What a victim must have been that monk who wrote *Hell Opened to Christians*, with its appalling pictures of demons driving bolts into men's skulls, and toasting them on great forks! The author of the Imitation of Christ, on the other hand, must have been blest with a good digestion, and a liver which gave him no "moods." His biographers say he was "a placid, kindly, fresh-colored old man;" and, indeed, his books reveal all that. Probably our best methods are always tinged with a shade of melancholy. Montaigne says, "the most profound joy has more of gravity than gaiety in it;" and Dr. Fothergill wrote of the mental attitude of feeling "delightfully low-spirited." "The rainbow of our thought life," as the author of Thorndale so beautifully expresses it, "is made of joy and tears, the light and storm." The dark and the bright threads of our life are so interwoven, that our healthiest attitude cannot be called unalloyed joy. The highest music, painting and poetry most truly express the sanest moods of man when they exhibit joy chastened by the "sadness which is most akin to pain." The lesson which we should endeavor to learn from a study of the moods which so easily possess us is the importance of a firm will control, acting like the inhibitory nerves. If our mental states are so often caused by pathological conditions, it is no less true that the mind can control the body; and the man or woman who, in popular phraseology, "gives way" to his moods, runs imminent risk of becoming their slave.—*Br. Medical Journal.*

ADULTERATIONS IN MICHIGAN.

A PLEA FOR THE APPOINTMENT OF A STATE FOOD COMMISSIONER.

The *Michigan Tradesman*, published at Grand Rapids, in its issue of January 22d, quotes from a recent number of the AMERICAN ANALYST an article relative to the new vinegar law, which it follows up with the following comment:

The Michigan legislature, at its last session, also passed a stringent vinegar law, prohibiting the use of the brands "cider" or "fruit" vinegar, unless fruit or fruit juices were used in their manufacture. The sale of vinegars below a certain standard of strength was also prohibited. This law went into effect on July 1, 1889, but all sorts of vinegar continue to be sold under the brand of "cider" or "apple" vinegar, and quite as much vinegar below the standard is sold as ever. When the law went into effect, there was a general sentiment in favor of observing its provisions, but as soon as it was seen that no concerted effort was made to punish those who violated the law—that no provision was made for an officer to attend to its enforcement—all thought of the law and its penalties faded into forgetfulness. The same is true of all laws of a similar character which have emanated from the legislature. No one undertakes to live up to the law, because there is no one to prosecute violators of the enactment. The statute books contain several chapters relating to the sale of bogus butter, but they are all dead letters, so far as being any benefit to the people is concerned. In spite of the law that all hotels and restaurants using butterine shall post a sign to the effect over the dining room door, no one has ever heard of such a step being taken. This subject appears to have been discussed at some length at the annual meeting of the Fruit Manufacturers' Association, which was held at Benton Harbor last week. President Almendinger is reported to have said, in the course of his annual address: "I saw a single shipment of glucose jelly from a Detroit concern of 4,000 gallons to one wholesale house labeled 'Pure Fruit Jelly,' and sold as such, when there was probably not 100 pounds of pure fruit in the whole lot, that single shipment taking the place of more than 750 barrels of cider boiled into jelly. If the State of Michigan tolerates such deceit, we hold her to be one of the parties to the fraud." True as the above charge probably is, the cities do not turn out all the unwholesome food. The fruit manufacturers themselves are not faultless in the matter, as a circumstance known to the *Tradesman* bears sufficient evidence. Within a hundred miles of Grand Rapids, a jelly factory converted into jelly hundreds of barrels of cider made from rotten apples, straw, manure and other articles of a foul character. A glance at the pile of filth shoveled into the cider press was enough to turn the strongest stomach. Yet the man who was responsible for this crime against his customers was loud in denunciation of the bogus jelly manufacturers of Chicago and Detroit. The same condition exists among nearly every branch of food producers. The dairymen have discussed this subject for years, and at their last convention expressed their sentiment by the adoption of the following resolution:

WHEREAS, The enactment of a measure providing for the appointment and maintenance of a Food Commissioner has become a recognized necessity; therefore,

Resolved, That we appoint a committee to bring this matter to the attention of the legislature and adopt such measures as would tend to secure the desired end.

The business men, too, have devoted much time to the discussion of the food question and have arrived at about the same conclusion. Few people desire to see the present reign of sophistication and adulteration continue. The majority prefer pure food and are entitled to get what they pay for. As State laws—without a special officer to enforce them—seem to be powerless, and as national enactments appear to be too cumbersome to afford any relief, the only way left open seems to be to follow the example set by New York, Ohio, Wisconsin, Minnesota and several other States, and press for the appointment of a Food Commissioner. Such officers have done good work in other States. Why not in Michigan?

LAUNDRY HINTS.

SOME PRACTICAL SUGGESTIONS FOR PRACTICAL HOUSEKEEPERS.

Buttermilk will remove tar spots sometimes. Rinse in soapy water.

A paste of soft soap and starch will take stains out of bed-ticking. Spread it on the spots, and when dry scrape off and wash with a damp sponge.

To remove grease stains from silk hats, use turpentine and then alcohol.

To iron a silk hat: Holding the hat in the left hand, pass a warm iron quickly around, following the lay of the nap.

To clean silk: The garment must be first ripped and brushed. Spread on a flat board an old blanket, covered with an old sheet; then sponge the silk on both sides, rubbing any dirty spots particularly with this mixture: one-half cup of gall, one-half cup of ammonia, and one-half pint of tepid soft water. Roll the silk on a stick—an old broom handle will do—being careful that no wrinkles are left on it. Let it dry without ironing. Woolen goods may be treated in the same manner.

All fancy hosiery should be put into a strong solution of salt and cold water before wearing, well saturated and dried without wringing, either in the shade or in a warm room.

To clean coats: Take of ammonia two ounces, soap one ounce, soft water one quart, and a teaspoonful of saltpetre; shake well, and let the mixture stand a few days. Pour enough on a coat to cover the grease spots; rub well; wash off with clean cold water.

Two ounces of common tobacco boiled in a gallon of water, rubbed on with a stiff brush, is used to renovate old clothes. It is said to leave no smell.—*London Housekeeper.*

A TIMELY WATCH.—A new contrivance has been applied to watches called an "appointment reminder." A small dial is set into the watch's face upon which one can set the hands at any hour required.

A DEADLY RECORD.—The statistics of wild beasts in India for 1888 show that they do not grow any less deadly. Twenty-two thousand nine hundred and seventy persons were killed in 1888, an increase of 600.

ALASKA SEALS.—A communication has been received at the Treasury Department from the Occidental Fur and Trading Company, of San Francisco, in regard to the Alaska seal fisheries. They charge that the present lease has resulted in the improper establishment of a monopoly, to the exclusion of all legitimate companies, and that the annual catch of 100,000 seal is sold in England, to the great prejudice of American dealers and manufacturers.

CURIOUS TIMEKEEPER.—A curious timekeeper, used in the outlying parts of southern India, has been presented to the British Horological Institute, by R. G. Orr, of Madras. It is a thin metal bowl rather deeper than a half sphere, with a very small hole in the bottom. When the flight of time has to be noted the bowl is placed in a bucket of water, and a boy sits watching it till, in about forty-five minutes, the bowl fills and sinks. Clearly the people in southern India do not trouble themselves about fortieths of a second, though a gentleman who has tried it says it is tolerably accurate, but the time of filling varies somewhat with the temperature of the water.

INVENTOR OF THE THIMBLE.—There is a rich family of the name of Lofting in England, the fortune of whose house was founded by an insignificant thing as a thimble. The first ever seen in England was made in London less than two hundred years ago by a metal worker named John Lofting. The usefulness of the article commended it at once to all who used the needle and Lofting acquired a large fortune. The implement was then called the thumb bell, it being worn on the thumb when in use, and its shape suggested the rest of the name. The clumsy mode of utilizing it was soon changed, however, but the name softened into "thimble" still remains.

PHTHISIS IN HIGH ALTITUDES.—From a report by Dr. L. Scrotter on the distribution of phthsis in Switzerland, it would seem that the inhabitants even of high altitudes are by no means so free from phthisis as we are perhaps wont to suppose. The tables of deaths for the eleven years 1876–1886 show that phthisis is endemic in every part of Switzerland, not a single district (Bezirk) being free from it. On the whole, the deaths from this cause are fewer in the high than in the low lying districts, but it cannot be said that the mortality from this cause is inversely proportionate to the altitude. Wherever there is a large industrial population the phthisis mortality is considerable. Industrial populations always suffer much more than agricultural populations where the altitude is the same.—*Lancet.*

CHINESE THEORY OF EVOLUTION.—The rocks are the bones of the divine body, the soil is the flesh, the metals are the nerves and veins; the tide, wind, rain, clouds, frost and dew are all caused by its respirations, pulsations and exhalations. Originally the mountains rose to the firmament, and the seas covered the mountains to their tops. At that time there was, in the divine body, no life besides the divine life. Then the waters subsided; small herbs grew, and in lapse of cycles developed into shrubs and trees. As the body of man, unwashed for years, breeds vermin, so the mountains, unlaved by the seas, bred worms and insects, greater creatures developing out of the lesser. Beetles in the course of ages became tortoises, earth-worms became serpants, highflying insects became birds, some of the turtle-doves became pheasants, egrets became cranes, and wild cats became tigers. The praying mantis was by degrees transformed into an ape, and some of the apes became hairless. A hairless ape made a fire by striking crystal upon a rock, and, with the spark struck out, igniting the dry grass. With the fire they cooked food, and by eating warm victuals they grew large, strong and knowing, and were changed into men.

NEW BOOKS.

A LIST OF PREFERRED NEWSPAPERS WHICH ARE RECOMMENDED TO ADVERTISERS. New York. G. P. Rowell & Co.

The number of American newspapers has become so large that the great advertising agencies do not find it wise to attempt to especially represent them all, and at the last meeting of the Association of General Newspaper Advertising Agents it was resolved that each member should prepare a list which, while enumerating the best papers, should name only about one in ten of all which are published. It has been demonstrated that fully one half of all the output of American newspapers emanate from less than seven hundred offices, and that a list of more than ten thousand newspapers can be made up, among which no single one prints regularly so many as a thousand copies. To have dealings with this myriad of small papers cannot be thought of by the majority of advertisers, and advertising agencies find transactions with them to be the reverse of profitable. Messrs. Rowell & Co., the well-known advertising agents of this city, have issued a pamphlet containing a choice selection of newspapers for an advertiser to use, who prefers to confine his advertising investments to such as are likely to pay him best. This catalogue names all the greatest and all the best newspapers. The selection made includes every religious, agricultural, or other class weekly, having a regular issue of so many as ten thousand copies; all the great monthlies, the leading dailies in all the largest cities, and aims to name the best paper in every county seat having a population of so much as three thousand, and every other town, village or city having so much as five thousand population, provided a paper is printed which issues as many as a thousand copies a week. The total output for a single edition of the publications named in this Catalogue of Preferred Newspapers is between fifteen and eighteen million copies, and is, therefore, more than enough to place a paper regularly with every family in every State and Territory. This list proceeding from such a prominent source is certain to receive careful examination from both advertisers and publishers. Messrs. Rowell & Co. have issued the *American Newspaper Directory* for twenty-two years. They now advise their advertising patrons that it will always be well to confine advertisement orders to papers selected from the Catalogue of Preferred Papers here referred to, unless the advertiser has some conclusive reasons of his own for using others. The population of every place where a newspaper is published is stated in the Catalogue; county seats are designated, and the circulation rating accorded to every paper by the last issue of the *American Newspaper Directory* is given. Out of the seventeen thousand papers named in the Directory, only about two thousand are selected; of these only 233 are issued in the State of New York, and among these it is, perhaps not necessary to add, the AMERICAN ANALYST is given the prominence to which its merits entitle it.

INVENTOR'S MANUAL. HOW TO WORK A PATENT TO MAKE IT PAY. By an experienced and successful Inventor. New York. J. F. Davison & Co.

The above is the title of a book containing much valuable information of interest to inventors and manufacturers. Thousands of useful and meritorious inventions are every year patented, but on which the inventor is unable to realize any profit simply for want of information as to the best method of introducing or disposing of his invention. The "Inventor's Manual" is a book of about 100 pages and is designed as a guide to inventors in perfecting their inventions, taking out their patents, and disposing of them. Among the subjects treated in this work are: How to invent.—How to secure a good patent.—Value of a good invention.—How to exhibit an invention.—How to interest capital.—How to estimate the value of a patent.—Advice on selling patents.—Advice on the formation of stock companies.—Forms for assignments, licenses and contracts.—State laws concerning patent-rights, and other items of information not generally accessible to the inventor or manufacturer.

THE LAIR OF THE ADULTERATOR.

HOW TOBACCO, WINES AND LIQUORS, SPICES AND EXTRACTS ARE MANUFACTURED TO ORDER.

(*Reprinted by request from the* AMERICAN ANALYST *of December* 15, 1885.)

On the west side of the Bowery, not far from Canal Street, is a tall and gloomy tenement. Its many rooms are filled to overflowing with workers in various industries. Through its halls and stairways passes an endless procession of customers. On the second floor is a vast room cut up by partitions into queer little dens. Clerks rush busily about, invoices come and go, and prosperity seems to hover about the place. There is a strong perfume everywhere. It fills the room, pours out into the corridor and even down the stairs into the street. It is not an unpleasant perfume in anywise. It seems an odd combination of flowers, mixed drinks and good cigars, as if a florist, a first-class bar-room and a tobacconist had formed a copartnership. Lured probably by this perfume, a reporter of the AMERICAN ANALYST found his way, during last month, into the place. As he entered, a clerk came forward with the characteristic smile of the suave salesman. The interview between him and the reporter was long and far from commonplace, as the reader will discover from the following conversations held on several different occasions:

"Business," he said, "was never better. We supply, you see, all the men who manufacture cheap, imitation or adulterated goods, and there are lots of them. These hard times help our trade. People want everything cheap, so that the dealer who sells an imitation article can undersell an old fogy rival who only handles straight goods. Take tobacco, for instance. In that compartment we have extract of Havana No. 1 and No. 2, Turkish elixir and opium flavor. I take this piece of tissue paper, sprinkle a drop of the extract on it, roll it up, and there you have a cigarette equal to the Honradez. Try it."

The reporter tried, as directed, and was surprised at the result. The smoke was remarkably like that of the best Havana tobacco, and with nine of ten users of the weed would be considered as genuine.

"Our largest business," continued the dealer in adulterants, "is in the liquor line. With French spirits and color as a basis, I can make you any liquor you want with our extracts. Here are the essences of Old Tom, London Dock, Swan, Holland and Schiedam gins, the extracts of Otard and Cognac brandies, rye, bourbon, applejack, Irish and Scotch whiskies, Santa Cruz, Jamaica and Medford rums, not to speak of the fancy cordials and liquors. To make Old Tom, I take a teaspoonful of French spirits, one of water, three drops of glucose syrup and two drops of the extract. That makes the Old Tom you have drank in a dozen saloons in this city. There are some funny things about this part of the business. Most people like their whiskey and brandy aged and free from fusel oil. But there are a great many, especially among manual laborers, who like it fresh and harsh. They want it 'to cut as it goes down.' To supply this demand we sell fusel oil to rectifiers and even retailers. They mix a barrel of whiskey, one of spirits and one of water with a gallon of fusel oil. That makes a ten cent rye which beats a torchlight procession. It's cheap, too, and stands an intelligent dealer in only a dollar a gallon. That's twenty cents a bottle and less than a cent a drink on an average. No wonder the rum sellers grow rich and become aldermen or go to Congress.

"Another good line is in spices and flavoring extracts. I can show you how to make a good mustard without using any mustard at all, and a good pepper, cinnamon or ginger without a lot of those spices in the stuff. In flavoring extracts, science is knocking the natural fruits out altogether. In that compartment we have essences of pear, vanilla, quince, banana, pineapple, raspberry, apricot, almond and peach, and they are simply pure chemicals. They are made out of compound ethers and these are distilled from rancid cheese, bad butter, plain alcohol and a lot of stuffs of the same sort. These go to the soda water men. For Sunday-school fairs, we put up concentrated lemonade, orangeade, sarsaparilla and root beer. A pound of our patent lemon juice and a dozen lemons, sliced fine, will make two barrels of lemonade, and a good lemonade, too. You want to be careful, though. If the lemon and raspberry extracts are not made by first-class chemists, they are apt to undergo some funny changes and become oil of turpentine, or something just as bad. I came very near being poisoned myself that way one day.

"Where do all these goods come from? Well, pretty much from everywhere. Formerly they were all made in France; but now Germany, England and this country have gone heavily into the business. Germany beats them all, though. In fact, the best American houses from whom I buy my goods, are run by German chemists who have come over here. That Havana extract and the Old Tom essence are both made here by two of them. We give them all the work they can attend to.

"Who are our customers? Manufacturers, spice mills soda water men, tobacco factories, rectifiers, confectioners, druggists, grocers and liquor dealers. They all want it kept dark, and when we ship goods they are always carefully packed, and there's no sign outside or seldom inside of what they are, or where they come from. It wouldn't do for a man who advertises 'absolutely pure extracts,' to be seen buying or handling our goods. In fact they're so careful that they hardly ever come here themselves, but do their business by mail. Is there much money in the business? Well, if I could make a good passable chocolate extract, I could make two hundred thousand dollars the first year. That's what we are all working for now!

"The only drawback is that some pirates have lately got into our business and imitate and adulterate our goods. It is doubly rough, because it is very hard to prove to our customers, scientifically, the difference between honest and dishonest goods. 'No, thanks. I'd rather not go out now and take a drink with you. I'd only be using my own goods or else some poor imitation of them.'"

The foregoing is not a fanciful sketch nor a freak of the imagination. The place actually exists, and the nefarious traffic is actually conducted there, as above described. We could give the precise locality, but it is the policy of the AMERICAN ANALYST to expose such frauds, and not to advertise them.

WHITE LEAD.

WHAT IT IS, AND HOW MANUFACTURED.

White lead, as it is offered to the painter ground in oil, is a carbonate of lead, called a hydrated carbonate of lead in chemistry because it contains a proportion of water held in chemical combination. This particular chemical combination cannot be brought about by immediate and quick chemical reaction, but must be accomplished by slow processes covering eight to twelve weeks. A carbonate of lead may be formed by making the metallic lead into solution and precipitating at once by the introduction of carbonic acid, but such a carbonate of lead would contain so large a percentage of carbonic acid as to unfit it for use as a pigment. It is desirable to obtain a carbonate of lead which shall have the largest proportion of lead in perfect chemical union with the least carbonic acid, and this is accomplished as

set forth below. Metallic lead of the greatest purity is used; this is obtained from our argentiferous (silver bearing ores) or galena. The silver being first extracted, having then the pure lead cast into pigs for convenience in handling, weighing generally 60 to 100 pounds each, the first step in the process is casting. The pigs are placed in a heavy iron kettle or crucible, under which is kindled a fire of sufficient temperature to melt the lead. When melted to such a degree as to run in a small stream from the kettle, an opening is made by means of a valve near the bottom of the kettle, and the lead is allowed to flow in a continuous stream therefrom, falling upon molds so linked together as to form an endless revolving belt or chain, each mold constituting a link in the chain and being hinged to the next. This chain of molds is made to pass in a lateral direction away from the kettle to such a distance as to insure the hardening of the lead by cooling, when it passes around a pulley, dropping out the molded lead as it is inverted. Continuing on around a second pulley, the molds are again right side up, and receive their charge from the stream of molten metal. These castings of lead are called buckles, from the fact of their having somewhat the appearance of a buckle in shape. They are made in thickness from an eighth to nearly half an inch. Instead of having a square shape, as buckles in general, the outer circumference is round, and the tines, as they might be called, reach all the way across and are united at both ends with the outer ring, which is from four to six inches in diameter. The openings between the tines and the outer rings admit of free circulation of air when placed in stacks for corrosion, and the thinness of the buckles presents the more surface to the action of the chemicals. In fact, these castings are made for the sole purpose of obtaining the greatest possible surface of lead in a given quantity for the free and more rapid action of the chemical vapors. Having now the lead cast into small buckles, the next step is setting these pieces of lead in the stacks or beds for corrosion. For convenience in handling and in order that the lead may not be pressed too closely together by its weight, small earthen pots are used in which to place it. These pots are constructed expressly for this use. They are generally about nine inches high, eight inches wide across the top, and taper to about five inches across the bottom, having the appearance of large flower pots. Two openings of about two inches in diameter are made in opposite sides of the pot, and one higher than the other to allow a circulation of vapors; and inside the pot, about one-third its height, are three or four projecting knobs, upon which the lead rests without being placed in the bottom of the pot. A corroding house, or bed, as it is sometimes called (generally built of wood, from 20 to 30 feet square, constructed with four sides and floor only, one roof covering a number of them), has spread upon its floor from 12 to 15 inches of spent tan bark, obtained from the tannery after it has served the purpose of tanning leather. Upon this layer of tan bark the pots are placed as closely together as possible until the whole layer of tan is covered by them. The next step is to pour into each pot about half a pint of vinegar (weak acetic acid), which fills the pot below the projecting knobs only. The buckles of lead are then placed in the pots, filling them from the knobs to the top. By this means the lead is above the acid without coming in contact with it. The pots, all being filled with acid and lead, are then covered with a layer of boards, which form a second floor, upon which another layer of tan bark is spread, followed by a second layer of pots, until eight or ten layers have been set and the bed or corroding house is full to the top, finishing with a layer of tan bark. A ventilating flue, about four inches square and running from the bottom layer out of the top of the corroding house, is placed either in the middle or to one side of the house. The setting is now complete, and the chemical action, called corrosion, begins. The first occurrence is the fermentation of the tan bark, which has been placed in the bed wet. This fermentation generates carbonic acid gas, and at the same time creates sufficient heat to raise the temperature of the whole to about one hundred and sixty degrees. The elevation of temperature causes evaporation of acetic acid. This vapor, rising in the pots, is circulated through the buckles of lead coming in contact with their surfaces and slowly forming an acetate of lead. Carbonic acid gas, which has no affinity for combining with metallic lead, combines readily with acetate of lead, displacing acetic acid, which passes away through the ventilating flue, and taking its place in combination with the lead, which is now carbonate of lead. Were it possible to unite carbonic acid and metallic lead directly, there would be no necessity for the use of acetic acid; but this being impracticable, acetic acid is used to bring about the union of the carbonic acid and the lead, and, having performed its part, it escapes through the flue into the open air. The corrosion of the lead, as above stated, begins upon the outside of the buckle and gradually works its way inward, until all the lead becomes converted into a carbonate—that is, if the corrosion is complete, which is seldom the case. Generally, upon opening the corroding house at the expiration of three months, about 65 per cent. only (by weight) of the metallic lead is found to have been corroded, the remaining 35 per cent. of metal being returned to the corroding house after having been separated from the white lead. The operation of corrosion having been completed, each layer of pots is uncovered in its turn, and the contents of the pots are dumped into barrows and carried to the separating apparatus, where the white lead is separated from the uncorroded metal by being placed in a revolving screen or sieve, the white lead falling through the small meshes to a receptacle below; the metal, being coarser, is thrown from the sieve into a separate compartment. The white lead, now being freed from the metal, is next crushed between rolls to pulverize the largest pieces, after which it is again screened, the screen revolving under water to prevent raising dust. This second screening is done for the purpose of separating the white lead from any particles of metal that may have remained after the first screening. These scraps are called "tailings," and are either sent back to the casting kettle or used in the manufacture of oxides of lead. The white lead which has passed through the screen accumulates in the tank of water in which the screen has revolved. Through an opening in the bottom of this tank the white lead passes to the hopper leading to the eye of the millstone, where it is ground between two burr stones, passing from the first mill immediately to a second, and from there to the floating tanks, the finer lead being carried farther in the floating tanks by a stream of water, and the coarser being deposited nearer and afterwards returned to the mills to be ground. When a sufficient quantity of white lead has accumulated in the floating tank to fill a kiln, the water is drawn off, and the white lead, in a pulpy condition, is pumped upon the kiln to be dried. In olden times these kilns were hearths constructed of fire brick, with fires beneath, and flues running the entire length of the hearth to distribute the heat uniformly; but it has been found cheaper and more advantageous to use long copper pans with steam jackets, by which means the temperature can be regulated at will by opening or closing a single steam valve. The white lead, having been placed upon the kiln or pan, is allowed to remain there until thoroughly dried, which usually requires from three to five days. The white lead is now ready to be mixed with linseed oil, which is accomplished by the two being stirred or agitated together. When the oil and white lead have become thoroughly combined, the mixture is again passed through the mills, to insure perfect fineness and thorough incorporation of the oil. This is the last operation in the process of manufacture, and it only remains to pack this finished product in packages of such sizes as may be required.

PERENNIAL PUZZLES.

SIMPLE PROBLEMS THAT HAVE PRODUCED MUCH PERPLEXITY.

Our learned contemporary the *Journal of Commerce* calls attention to the circumstance that certain problems, chiely arithmetical in character, seem to be endowed with a vigorous immortality. No matter how often the solution is printed, or how widely an exhaustive answer is published, the question comes up again, before the ink is fairly dried, to the lips of hundreds who have not seen the reply, or who either cannot understand it or will not accept it. There are several of these which we have printed so often, but which still kept coming, that to save further time we struck off a hundred proofs of each, and mailed one to the inquirers in succession without comment. These proofs are exhausted, and we have accumulated from a score or more of correspondents the same old questions, with urgent requests for a fresh solution. We notice that the Brooklyn *Eagle* has been struggling with one of these. The editor who has charge of that department is very clever, and we think he is playing a little with his inquisitor. The original question sent to us forty years ago, and involving the same point submitted to the *Eagle*, was, how to find the product of £19 19s. 11d. 3f. multiplied by itself. Of course, if the parts of the pounds were stated as fractions, and the pounds as whole numbers, then 19 959-960ths could be multiplied by itself. But money of account has not two dimensions. If a table is 4 feet wide and 4 feet long, then 4x4=16 feet, and we have the number of square feet on the surface. Five times five pounds are £25, but five pounds times five pounds is unmeaning, as money does not measure itself in that fashion. Twice two children are four children, but twice children two children has no meaning. So "nineteen pounds, nineteen shillings, eleven pence, three farthings times nineteen pounds, nineteen shillings, eleven pence, three farthings," is utter nonsense. The next puzzle on the list, and one which comes the oftenest to our desk, in some form of a problem which proposes to divide a whole sum into fractions that together did not make the dividend. The original of this in our columns was an answer to an actual case where a man in his will had devised one-third, one-fourth, one-fifth and one-sixth of his property respectively to his four children, supposing that he had thus devised the whole of his estate. The fractions mentioned only made nineteen-twentieths of a whole number. This is easily seen if they are reduced to a common denominator. One-third is twenty-sixtieths, one-fourth is fifteen-sixtieths, one-fifth is twelve-sixtieths, and one-sixth is ten-sixtieths, which together make but fifty-seven sixtieths, leaving three-sixtieths (or 1-20th) to make up the whole number. This puzzle reappears in some form every few days the year round. It is answered on the same principle involved in the interpretation of the Arab's will. He had fifteen horses and four sons. He devised his estate, giving one son a half, another a quarter, another an eighth, and the last a sixteenth. They found it impossible to agree on a division. The eldest son insisted that as seven horses would not be half of fifteen he should have eight; but the other sons objected, and as neither one-half, one-fourth, one-eighth nor one-sixteenth would give either son an even lot, they had a fierce dispute over the division. A venerable sheik rode up just as the quarrel was at its height, and to compose their differences dismounted and generously offered to add his mare to the fifteen belonging to the estate, agreeing that each should take his allotted share from the whole sixteen, only stipulating that he should be the last selected. The addition made an easy solution of the difficulty. The first then took eight as his half of the sixteen, the next took four for his quarter, the third took two for his eighth, and the fourth took one for his sixteenth. As this made but fifteen the sheik mounted his horse and rode away. The Arab boys regarded it as a miracle, and exclaimed

that Allah had given a horse to the sheik for his generous interference. In spite of this oft-told tale the problem still survives, and annually puzzles hundreds of our countrymen. A more recent problem which we have already answered several times, but which is repeated every week from some quarter, is the division of one fraction by another. The original question which we answered several years ago was: "What is the quotient of two-thirds divided by one-half?" The unthinking person would say that as the half of two-thirds is one-third, this must be the solution of the problem, but Daboll will easily refute it. The quotient of 2-3 divided by $\frac{1}{2}$ is 1 1-3; that is, $\frac{1}{2}$ will go in 2-3 one and one-third times. The last form of the problem, received as we write this, is to find the quotient of 1 divided by $\frac{1}{2}$, two partners in a leading banking house, having disputed, as they say, all one day over the result, the senior maintaining that 1 divided by $\frac{1}{2}$ is $\frac{1}{2}$, and defying any one to refute it. We answer that when 1 is divided by $\frac{1}{2}$ the quotient is 2; that is, $\frac{1}{2}$ will be found two times in 1. If 6 be divided by $\frac{1}{2}$, the answer is 12; that is, there are twelve halves in six. We should beg pardon of our readers for repeating these demonstrations if it were not for the character and magnitude of the disputes which occur every day concerning them. We have reserved for the last of the puzzles the century question, which will never be laid to rest, we believe, as long as the world stands. We printed 250 proofs of a former answer, and they have all been distributed to parties who have quarreled over it. A writer whose initials are E. E. B. asks us in a letter just to hand whether the twentieth century begins with January 1, 1900, or January 1, 1901, and declares that of all whom he addressed for an answer about half took one date and half the other. There should be no question about it. This century ends with the last moment of the year 1900, and the next begins with January 1, 1901. The muddle grows out of the fixed idea which some people have that the reckoning of time begins with a cipher, and that one is counted when the hour, day, month or year has closed; whereas all the counting of time begins with one, and at the end of the first period two begins to count. Thus, when a child is born, he enters on his first day of the first month of the first year of his life. His ten years are finished, not when he enters in his tenth year, but at its close; and his hundred years are completed, not when the hundredth year is begun, but ended. When we write 1900 we have begun the last year of the century, not ended it. The centuries do not begin with 0, 100, 200, but with 1, 101, 201, and thus the twentieth century begins with 1901 at the first moment of that year. The quoted date comes with the beginning, not the close of the twelve months; and therefore, while we quote the year 1900 as we do every other year at its beginning, we must wait till it ends to close the century.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

February.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, pork.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, geese.

FISH.—Bass, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish.

VEGETABLES.—Artichokes, beets, beans, cabbage, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, tomatoes, turnips.

FRUITS.—Apples, bananas, grapes and oranges.

PRACTICAL RECIPES.

RICE SOUP.—To make about a quart of soup, take a part of white stock and to it put a bay leaf, a small piece of onion, a stalk of celery and a large tablespoonful and a half of rice. Let it cook slowly for an hour, then add a teaspoonful of butter, a pint of cream, and pepper and salt to taste. Stir well, let it just boil and it is ready to serve.

HASH.—Take four cupfuls of meat, free from gristle and fat, and chop it fine. Brown a teaspoonful of flour and mix with the meat, add a third of a cupful of gravy and three tablespoonfuls warm water, and let it cook slowly for ten minutes, giving it an occasional stir. Let it set for a few moments on the back of the stove where it will cool a little, add half a cupful of cream, heat thoroughly, pour over thin slices of toasted bread, and serve.

BAKED BANANAS.—Cut a strip from one side of the bananas and place them, in a pan with this side uppermost. Sprinkle thickly with granulated sugar and bake in a moderate oven until they are soft and tender, watching carefully that they do not burn. Serve very hot.

SPONGE CAKE.—Beat the whites of four eggs to a stiff froth and the yolks of the same till they are very thick. Add to the yolks one and a half teacupfuls white sugar and three tablespoonfuls cold water; after they are thoroughly mixed add the whites and stir them well in. Now add two teacupfuls sifted flour, two heaping teaspoonfuls Horsford's baking powder; stir well and sift again. Lastly, stir the flour so prepared into the sugar and eggs, and when well stirred in put immediately in a well-heated oven.

LEMON CREAM PIE.—One teacupful powdered sugar, one tablespoonful butter, one egg, the juice and grated rind of one lemon, one teacupful boiling water and one tablespoonful corn starch dissolved in cold water. Stir the corn starch into the boiling water, cream the butter and sugar, and pour over them the hot mixture. When quite cool, add lemon and the beaten egg. Take the inner rind off the lemon and mince very small. Bake without top crust.

MACAROONS.—One pound of powdered sugar, half a pound ground almonds, or almond paste, two ounces bitter almonds, one and a half ounce ground rice, six whites of eggs. Sift all together on the board, make a bay, break in the whites, rub well fill into a bag with moderate size tube, and lay oet on paper in fingers about two inches in length; lay a split almond in the centre. Bake in a moderate oven. These biscuits are best splashed slightly with water. Do not bake in too hot an oven or you will spoil them.

FRIED CELERY.—Boil some fine stalks of celery, lay them on a dish, season with pepper, salt, chopped parsley, vinegar and sweet oil; after they have lain in this mixture one hour, dip them in butter and fry in hot lard. When brown, drain, sprinkle with salt and serve.

WINES NATIVE OR FOREIGN.

SOME SIGNIFICANT STATISTICS OF OUR IMPORTATIONS OF WINE.

When we look at the statistics of the importation of foreign wines as compared with the production of native wines and then remember the infinitessimal proportion of native wines on the wine lists of our large hotels and restaurants, we must inevitably conclude that a foreign label on a wine bottle in seven cases out of eight is a snare and delusion. This is not a mere assertion, but stubborn facts bear it out. The importation of foreign wines in 1840 and 1888 were as follows: 1840, 4,748,362 gallons; 1888, 4,654,545 gallons. Thus it would seem that the actual consumption of foreign wines is no larger now than it was fifty years ago. Most of the wine is drunk by men who know, or consider it necessary to act as if they knew good wine from bad. Do they really know?

With most insignificent exceptions the wine drunk at hotels, in fashionable restaurants, at clubs and at private tables is foreign, or pretends to be foreign. Few wine lists have American wines on them, and if they are not, d they take up an insignificant place on the card. Here and there American wines are drunk, and their use is steadily and sensibly increasing, but so far as labels go, American vintages constitute an insignificant portion of the whole. The figures we have given, are almost exactly the same for both years. In forty-eight years the national capacity for foreign wines had not altered perceptibly. Everything else had changed. Our population had more than tripled, growing from 17,069,453 to 64,000,000. Our wealth which might be held a fairer measure of the capacity for costly foreign wines, has grown from less than $10,000,000,000 to over $60,000,000,000. Our cities have grown from a New York of less than half a million to one of nearer 2,000,000. The thirst of Chicago and San Francisco, and all places between where "champagne and other wines" of rare labels are nightly opened, has been added to the national demand. We have built our entire railroad system, and everybody knows the skill, the capacity and the ability of a railroad man in dealing with the wine—as freight. We have added enormously to the thousands whom a few years abroad always gives new views and new tastes, and more rarely new discrimination in dealing with foreign wines. But the statistics of our imports remain. No more wine reaches this country than did in 1840. The returns may not have been completed then; they are far more rigorous and accurate now. The amount of wine smuggled is trifling. There is no possible question that the figures we have given above are accurate, and 1888 was a very good year for wine imports. The average imports for the five years ending in 1888 were 4,350,000 gallons. This includes everything, cask and glass, still and sparkling, French, German and all. This is not half the average imports ending in 1874. For five years before, the average had been 9,700,000 gallons. It had been at this point for over ten years. From 1840 to 1874 the consumption of imported wines had risen with the population or nearly so. In thirty-four years the population had increased about two and a half times and the demand for wines had grown at about the same rate. This was natural although, one would have expected a larger increase in view of our wealth having trebled in this time. But by a curious coincidence, in 1874, which was the last year that wine imports went over 9,500,000 gallons, the American wine product rose to 10,951,859 gallons. In four years this product has trebled. In 1870 it was only 3,059,518 gallons, one-third the imports It has grown fast since. In 1888 it was 31,680,523 gallons almost exactly seven-fold the importations of wine. The wine drinker has not discovered this. We sadly fear the wine seller long since found it out to his profit. The total consumption of wine in this country has grown seven and one half fold since 1840—which is about the increase one would expect. It has grown six fold since 1850, three and a third since 1860 and tripled since 1870. This is the increase one would anticipate, all things considered. But our consumption of foreign wines has not grown since 1840, is two-thirds that of 1850, and one-third that of 1860 and 1870. This one would not expect judging from the labels. We commend these indubitable facts to wine drinkers—particularly those wise and experienced drinkers who know all about it and have trained tastes on wine. One bottle out of eight of the wine drunk here is foreign—no more and rather less. The rest is native or manufactured.

MEDICAL WOMEN.—There are over 3,000 medical women in the United States, whose income is said to range from $5,000 to $20,000 a year. The number is also steadily increasing, so that in time we shall probably have as many female as male physicians.—*Med. & Surg. Rep.*

ATHLETIC CHRISTIANITY.

GYMNASTICS AND EVANGELIZATION AS COMBINED IN NEW ENGLAND.

The following article, which we republish from the Boston *Transcript*, is sufficiently suggestive to render comment unnecessary:

The Listener had never been so fully impressed with the completeness with which Christianity and muscularity have become interwoven as he was yesterday, when he met a young friend who showed him a certain circular and related his experiences in connection with it. The young gentleman is a graduate of one of our most famous colleges; he is of excellent moral character and unexceptionable associations, and besides being an athlete by natural gifts, has spent two years in study with Dr. Sargent with a view to the adoption of gymnasium instruction as a means of livelihood. Having completed his study and feeling that his qualifications were thorough, the young gentleman made application for employment as instructor at the gymnasium of a Young Men's Christian Association in a neighboring city, where he had heard such an instructor was needed. He received a reply stating that an instructor was, indeed, wanted at that establishment. His correspondent was pleased to enclose him a list of questions, upon a printed blank, accompanied by the request that, "as the office of gymnasium instructor of a Young Men's Christian Association is one requiring such varied and peculiar gifts and involving so great responsibility," he would "please give frank and prompt answers to *all* these questions." The gymnasium instructor at once bent his attention to the questions. Some of them, merely touching his qualifications as an athletic instructor and his previous occupations, he answered readily enough; but there were others which rather nonplussed him. For instance, this: "Why do you desire to enter upon the work of a gymnasium instructor rather than some other line of Christian work?" The first half of the question was easy enough. He became a gymnasium instructor because he had adopted it as a means of livelihood; but why that rather than some *other* "line of Christian work?" But this question was nothing to those which followed, to wit:

How long have you been a Christian?

What offices have you held in the Church?

What kind of religious meetings have you conducted?

What experience in teaching a Bible class?

How long have you systematically studied the Bible?

What experience have you had in dealing with inquirers, and where?

Can you point to instances where you believe you have been used in leading men to Christ?

These last questions rather staggered the young gymnast, who had an idea that the qualifications which were to be expected of him in his chosen work of teaching the young muscle how to shoot were not exactly of this nature. He had, indeed, expected to be called upon to prove his moral character and sober life; but to find the inquiry directed to his record as an active evangelist made the cold drops stand on his brow. He went on, however, to the next questions, which were as follows:

What experience have you had in public speaking?

What association literature have you read?

Do you take the Y. M. C. A. *Watchman*, and if so, for how long?

This last inquiry determined the course of the Listener's young friend. He made up his mind that a mistake had been made, and that these questions were intended to be answered only by applicants for missionary positions. He wrote the secretary a respectful letter stating his conclusion to this effect, and enclosing the blank with the questions answered which seemed to be relevant, and was astonished to receive, almost by return mail, a letter from the secretary assuring him that no mistake had been made, but that, on the contrary, these were the very questions to which satisfactory answers would be required from applicants for the position of gymnasium instructor. That, and that only, the secretary intimated, was the sort of gymnasium institution that the institution wanted. He returned the blank for further replies to the questions.

The young man gave the matter up as a bad job. He was by no means clear in his mind as to how long he had been a Christian, or as to whether, under the definition of his proposed employers, he was a Christian at all. He has, since relinquishing all hopes in this direction, accepted a proposition from another place, which is, however, not in New England.

HEAVY HAIL.—A recent hail storm at Louth, South Australia perforated the iron roofs of buildings, killed dogs and other animals caught in the street, and destroyed thousands of panes of glass.

LAMPS IN THEIR HELMETS.—In an entertainment given at a village in Illinois a few nights ago a novel use of incandescent lamps was made. Several young ladies gave a drill in military costume. Their helmets were surmounted with three incandescent lights, with red, white, and blue globes. In certain parts of the drill the lamps were suddenly illuminated, and the effect was striking. The means by which this was accomplished was extremely simple. A converter was placed on the outside of the building in which the hall was located. The secondary wires ran under the floor to brass plates about three inches square, arranged in twos on the stage floor. From the lamps on the young ladies' helmets concealed wires ran down to little brass plates in the heels of the shoes. After concluding a series of evolutions each young lady would come to a stand in the front of the stage and plant her heels firmly on the plate on the stage. The lights would flash up and contribute greatly to the general effect.

Splitting Pens.—In cutting the slits in gold pens a circular saw is used that is the smallest in the world. It is a tiny hard steel disk, about the size of a shilling, and it is no thicker than a sheet of thin paper.

English Fads.—Some of the new English freaks in table decoration are almost incredibly tasteless. Boxes imitating battle-axes, helmets, spears, and keys are made the receptacles for blossoms, and ribbons of frosted gauze are used to hold the stems together. The helmets would be tolerable at a military dinner, but elsewhere they are absurd. Why not use a silk hat for a flower vase?

Grape Syrup.—A syrup is being manufactured in California containing seventy-five per cent. of saccharine mattor. This syrup is made by concentrating grape juice in a vacuum pan. One ton of grapes yields 160 gallons of juice, which is reduced to one-fourth of its bulk. At the price which this syrup ought to bring, it seems a good outlet for the over production of grapes. Mission and Malvoisie grapes principally are used.

Traveling Post Office.—The Berlin postmaster has just inaugurated a very practical post office. Large postal carriages, from ten o'clock in the morning till seven in the evening, traverse the whole city and serve both as letter boxes for receiving the mail and as post offices in which employees classify and stamp the letters as they are thrown in. They are thus ready to be forwarded on their arrival at the central station. Nearly an hour is thus gained in the transmission of the mail matter.

Value of Silver.—Silver, in its relative value to gold, has varied greatly at different times. In the days of the patriarch Abraham it was 8 to 1; B. C. 1,000 it was 12 to 1; B. C. 500 it was 13 to 1, and at the commencement of the Christian era it was 9 to 1. In the year 500 A. D. it was 18 to 1; 1,100 it was 8 to 1; and in 1,400 it was 11 to 1. In 1454 gold was only six times more valuable than the precious white metal, silver, and within the next hundred years two pounds of silver could be exchanged evenly for one of gold. In 1600 gold was again worth ten times as much as its paler brother. In 1725 gold was thirteen times more valuable than silver, just as it was 500 years B. C. At the beginning of the present century it had risen in value to a higher point than at any time since 500 A. D., being fifteen times more valuable than silver. In 1876 the ratio of silver to gold was twenty to one, and in 1886 it was at the highest point ever known, since which time it has gradually declined to twenty to one.

Substitute for Glass.—A new substitute for glass in the form of varnish covered wire is now being used where glass will not stand the vibration or other conditions. The transparent wirewove roofing which is translucent, pliable as leather, and unbreakable, has for its basis a web of fine iron wire, with warp and weft threads about 1-12 inch apart. This netting is covered on both sides with a thick translucent varnish, containing a large percentage of linseed oil. The process of manufacture is conducted by dipping these sheets into deep tanks containing the composition until the required thickness is obtained; the sheets are then dried in a heating chamber, and after being stored for some time till thoroughly set, are ready for use. The sheets can be made any color from amber to pale brown. The new material adapts itself to curves or angles in roofing, and is unaffected by steam, the heat of the sun, frost, hail, rain or any atmospheric changes. Being a nonconductor, buildings remain cool in summer and warm in winter.

The Lightning Rod.—Everybody believes that Franklin was the inventor and constructor of the first lightning-rod. In this one particular everybody is mistaken. The first lightning catcher was not invented by the great philosopher, but by a poor monk of Scuttenberg, Bohemia, who put up the first lightning-rod on the palace of the curator of Preditz, Moravia, June 15, 1754. The name of the inventive monk was Prohop Dilwisch. The apparatus was composed of a pole surmounted by an iron rod, supporting twelve curved branches and terminating in as many metallic boxes filled with iron ore and enclosed by a wooden box-like cover, traversed by twenty-seven iron-pointed rods, the basis of which found a resting place in the ore box. The entire system of wires was united to the earth by a large chain. The enemies of Dilwisch, jealous of his success, excited peasants of the locality against him, and under the pretext that his lightning-rod was the cause of the excessive dry weather, had the rod taken down and the inventor imprisoned. Years afterwards, M. Melson used the multiple pointed rod as an invention of his own.

Paper Pillows.—All England is crazy on the subject of paper pillows. You tear the paper into very small pieces, not bigger than your finger nail, and then put them into a pillow sack of drilling or light ticking. They are very cool for hot climates, and much superior to feather pillows. The newspapers are printing appeals for them for hospitals. Newspaper is not nice for use, as there is a disagreeable odor from printer's ink; but brown or white paper and old envelopes are the best. As you tear them stuff them into an old pillow case, and you can see when you get enough. The easiest way is to tear or cut the paper in strips about half an inch wide, and then tear or cut across. The finer it is the lighter it makes the pillows.

Fortune in a Hole.—An old farmer in the Granite State one Sunday morning started to wind up his great silver watch, and found that the key was filled with dirt. Being unable to dig the matter out with a pin, the farmer drilled a hole in the key, and, with a single breath, blew all the dust out. Then he sat down to think, and within a month had patented that hole. To-day, in Lebanon, N. H., there is a large factory running by electric power, wherein are manufactured daily thousands and thousands of watch keys of every possible size, shape and design. Each one of these keys contains the hole which has been patented by the farmer. The latter has already made a fortune.

Musical Gas.—A musical gas machine, called the pyrophone, has been brought out in England. Its compass is three octaves and it has a keyboard and is played in the same manner as an organ. It has thirty-seven glass tubes, in which a like number of gas jets burn. These jets placed in a circle, contract and expand. When the small burners separate, the sound is produced: when they close together the sound ceases. The tone depends on the number of burners and the size of the tubes in which they burn, so that by a careful arrangement and selection, all the notes of the musical scale may be produced in several octaves. Some of the glass tubes in which the jets burn are nearly eleven feet long.

BUSINESS NOTES.

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CONTENTS.

HUMAN MAGNETS.

In our issue of December 12 mention was made editorially of an investigation then being made by Prof. Simon, of the Johns Hopkins University, respecting the alleged magnetic powers possessed by a young man of Baltimore, named Hamburger. We learn from the *Electrical World* that the inquiry proved pretty conclusively that the facts in the case were assignable to other causes than magnetism. The subject was able to maintain by mere contact with the fingers a weight of 2,500 grams; but it was shown that this power was exercised only on very smooth or highly polished substances, glass being the most favorable in this respect. The cause assigned by Dr. Simon to account for the observed facts, and which is probably the correct one, is the well-known adhesion between two bodies brought into such close contact as to exclude the air between them, the pressure of the atmosphere acting to maintain the bodies in contact. It is, therefore, only a question of the smoothness of the skin, which would appear to be the qualification necessary to enable any one to manifest "magnetic" properties; indeed, the experiments made show that this quality can be cultivated to some extent. As the experiments of Dr. Charcot, of Paris, have shown that hypnotic influence can be exercised by a piece of wood shaped and painted in imitation of a steel magnet, the above additional evidence of the non-existence of any real magnetic qualities in the human body will go far toward setting at rest any erroneous impressions which may still exist in the minds of some on the subject. We find in the daily papers frequent announcements of the alleged wonderful "magnetic" qualities exhibited by certain individuals, who are able to make various substances adhere to their hands without exerting any muscular pressure upon them. The miscellaneous nature of the bodies which are embraced in the list of such adherents, embracing wood, glass, etc., would at once dispel the theory that magnetism, either "personal" or otherwise, had anything to do with the phenomena, but they are so rarely investigated with the object of reaching their true cause that an instance of the latter deserves attention.

AN INQUIRING EDITOR.

The editor of the *American Lancet*, of Detroit, in a recent article, headed, "Are Baking Powders Injurious to Public Health?" concludes with the determination "that the matter of the healthfulness of baking powders remains an open question, with a probability that the whole brood of baking powders, while convenient, afford the least healthful mode of ærating bread. As bread is the one article of constant and general consumption, it would seem most desirable that farther studies should fairly and finally settle the moot question, unbiased by the trade interests at stake." The editor who makes this suggestion having an M. D. attached to his name would naturally be supposed to be the most likely person to make these farther studies, but he excludes himself by his evident dense ignorance of the chemistry of baking powders, which is inexcusable in a medical editor when he attempts to arouse the public through the medical profession against imaginary danger. Inferentially, he states, that baking powder is an inferior substitute for leaven, ignoring the important fact that leaven acts upon dough by a process of decomposition, while baking powder acts as a chemical mechanical agent to produce the same result in a clean and always certain way. Next he classes cream of tartar, calcium phosphate, which he misnames phosphoric acid, and alum together; and, after admitting that these different drugs are harmless in small doses, asks, if used in the preparation of food they are harmless? Would he ask a similar question about bichloride of mercury, iodine, and rhubarb, all of which, in small enough and proper doses, are harmless. He leads us to infer that the chemical action which takes place in baking can convert a harmless acid or alkali into a violent poison. Next, in quoting from Prof. Mallet, he makes the very funny blunder of reading that gentleman's strictures upon alum powders, which generally contain acid phosphate of calcium, as directed against a pure acid phosphate of calcium baking powder containing no alum—a baking powder which every chemist and food expert in the land commends, and against which even the most unscrupulous competitors cannot say a word. These exhibitions of ignorance are inexcusable in a physician, especially when he ventilates them in a medical journal. Besides all this, it is a notorious fact that not one loaf of bread in a thousand is made with baking powder, but this not being within the ken of medical men we can overlook. Let the editor study up Atfield or any other elementary work on chemistry, or even a good cyclopædia. Such a lack of chemical information accounts for such amusing questions as asking the difference between saleratus and bicarbonate of soda or talking about potash lye when handling caustic soda.

BOGUS WINE AGAIN.

Following close on our exposé last week, of the character of our imported wines, in which we showed that according to the government statistics only one bottle out of every eight of so-called imported wine is genuine, a little additional information has been brought to our attention. A large champagne house, who also import quantities of other wines, were lately looking around the market for a cheap California port wine, for the purpose, as they frankly stated, of "cutting their imported port." The same house not long since purchased some forty thousand gallons of dry California wines. As they advertise that they deal in only imported wines, what did they do with the California wine?

IMPURE MILK IN NEW YORK.

The Milk Producers' Union, which represents the industry from which New York draws its milk supply, held a meeting in New York on January 30th. Over five hundred farmers were present. The most earnest discussion during the session arose from a series of resolutions offered by H. Mabie, of Putnam County, in which the State Dairy Commission was taken severely to task for not preventing the sale of adulterated milk in this city. In supporting his motion, Mr. Mabie attacked both the Dairy Commission and the Board of Health as gigantic frauds, supported by the taxpayers at great cost and returning no benefit whatever. Secretary Winston defended Dairy Commissioner Brown as a conscientious officer, and threw all the blame for imperfect execution of the law upon his subordinates. Mr. Mabie's resolutions led to several others of the same general tenor. It was evident that the delegates were substantially unanimous in despising the Dairy Commission and in believing that the New York Milk Exchange adulterates its wares, but they didn't like to say so too flatly. E. G. Fowler, editor of the *Orange County Farmer*, explained that the Dairy Commissioner and his subordinates are handicapped by the law, which provides that all milk for general consumption must contain at least 12 per cent. of solid matter, one-fourth of which must be fat. The result of this is that, as farmers sup-

ply very rich, pure milk, the Exchange can mix skimmed milk with it to the extent of ten quarts to the can without diluting the solids below the legal limit. The sense of the Convention was finally expressed thus:

Resolved, That we, the members of the Union of Milk Producers for the Supply of the New York Market, are in favor of absolutely pure milk, and we demand such a modification of the laws of the State as will render the extensive adulterations now practised impracticable, easy of detection, and provide a severer punishment than the law now imposes.

The Union would have hit the nail square on the head if it had said that Dairy Commissioner Brown, like a bull in whose eyes a red rag is flaunted, busies himself so much and wastes the money furnished by the State in hounding honest manufacturers of oleomargarine, that he has neither time nor means to attend to the more important item of milk.

THOSE ARTIFICIAL BEANS.

Chemist Martin of the Board of Health of this city last week received from Dr. Newton, State Food Commissioner of New Jersey, some specimen beans of the fraudulent coffee, described in the last issue of the AMERICAN ANALYST, that has lately been put upon the market. The specimens are from several tons of spurious beans seized in Trenton. They look exactly like Mocha beans. Dr. Martin is having them analyzed.

THE COLOR OF WATER.

WHY DIFFERENT BODIES OF WATER VARY IN COLOR.

What is the color of pure water? Almost any person who has no special knowledge of the subject will reply at once, "It has no color." Yet everybody knows, either through hearsay or by the evidence of his own eyes, that the ocean is blue. Why the ocean looks blue is a question that few who have crossed it have ever sought to solve, and there are, probably, many travelers who, though they have seen most of the famous rivers and lakes in the world, have failed to notice the remarkable differences in color which their waters present. Even the ocean is not uniform in color; in some places its waters are green, or even yellowish. Some lakes are distinctly blue; others present various shades of green, so that in some cases they are hardly distinguishable from their level, grass-covered banks; a few are almost black. The Lake of Geneva is azure-hued; the Lake of Constance and the Lake of Lucerne are green; the color of the Mediterranean has been called indigo. The Lake of Brienz is greenish yellow, and its neighbor, Lake Thun, is blue. New York has both green and blue lakes. The colors of rivers differ yet more widely. The Rhone is blue, and so is the Danube, while the Rhine is green. Anybody who has traversed the wonderful Adirondack region and fished in its waters must have noticed the remarkable difference in the color of its rivers and smaller streams which radiate in every direction from the central group of mountains. The waters of the Sacondaga are yellowish, while those of the Canada creeks and of the Mohawk are clear, with perhaps a bluish tint in deep pools. Fish Creek is black or deep brown, and its neighbor, Salmon River, is colorless. Next comes the Black River, whose color is indicated by its name, but between it and the Grasse, which is also black or brown, is the Oswegatchie, with clear white waters. The St. Regis, again, is black, but the Raquette is white. The St. Lawrence is blue. These various hues are not caused by mud, or any opaque sediment, such as that which makes the Mississippi coffee-colored, but belong to the waters, like the golden color of tea, without greatly impairing their transparency. The cause of the difference in the color of lakes and rivers has engaged the attention of many celebrated investigators of Nature, such as Tyndall, Bunsen, Arago, Sainte-Claire Deville and others. Recently Prof. Spring, of the University of Liege, has carefully investigated the question of the color of water and has reached some interesting conclusions. According to him, absolute pure water, when seen in masses of sufficient thickness, is blue, and all the varieties of color exhibited in lakes and streams arise from the presence in the water of mineral salts of different degrees of solubility and in varying quantities. Water containing carbonate of lime in a state of almost complete solution remains blue, but if the solution is less complete the water will have a tinge of green, which will grow stronger as the point of precipitation is approached. Prof. Spring concludes that, if lime is added to blue water in which so much carbonate of lime is already dissolved that the point of saturation is approached, the water will become green. In proof of this he cites the fact that the water near the shores of lakes and seas, where it comes in contact with limestone, is generally of a greener hue than elsewhere.—*Nature.*

HOME-MADE BREAD.

A BRITISH VIEW OF THE INFLUENCE OF DOMESTIC BAKING ON FEMALE CHARACTER.

Whatever may be the case in London and other great towns, it is certain that in the rural districts of England the entire abolition of public bakehouses, or the formation of any trust which would raise their produce to famine price, would be in the nature of a public benefit. For partly owing to the growth of the feminine disinclination to work hard, and partly to the onward progress of gentility, there has latterly been an increasing tendency on the part of poor people to refrain from kindling the oven fires. Lovers of the old ways assert that the British laborer becomes more fastidious daily. He curls the lip of scorn at the black bread—the cake of peas and barley meal—which, after being his staple food for centuries, is now almost abandoned. It has not yet been given up entirely though. The cottage wife, knowing how easily it can be made—for it only needs a little salt and a little soda added to the meal which the miller has ground from peas and barley gleaned by the children—still in the north of England makes her bannocks. In Scotland, where barley bread was the common food of workingmen till far on in the nineteenth century, it is superseded by the almost equally economical oat cake. Not so very long ago, in both countries, the laborer who had only one hot dinner in the week, on other days behind the hedge or in the shelter of a dry ditch, or the corner of a bieldy stone quarry, made his dinner off this black bread and cheese or fat bacon, washing it down with cold tea or coffee. Venerable yokels sometimes say that they can eat no other; but their taste was formed in times when flour was a luxury beyond the power of a poor man to purchase. As is always the case, the younger generation go to the other extreme, and pretend to look down with contempt upon all kinds of home-made bread. Yet, for all that, baking day in farmhouse or cottage is still the most important and busiest of the week. By universal custom, it is Friday, for in the country there are markets to attend to on Saturday, and Friday is the next convenient day for the Sunday. The sight of a farmhouse kitchen, or even of a decent laborer's kitchen on the night of baking day is enough to do one's heart good. If the family is a fairly large one, a stone of flour and a stone of wheat meal have been used, and the loaves are cooling on the kitchen table, seven white and seven brown. But they represent only a portion of the day's work. From the oven still comes an aroma which tells of the rabbit pie cooking for Sunday's dinner, and there are apple tarts and pasties in quantities which might be thought enormous did we not know how swiftly they will disappear before appetites sharpened by the air of the fields. And even this does not exhaust the list of the day's baking, for the children would be disappointed if there was not a cake for each when they came home from school, and Sunday would not be Sunday if there were not something nice for tea. In the Midlands it would be a currant loaf or a sponge cake; in the north a thin cake with kneading in it, to be taken hot and buttered; and in many districts the whole of the materials for the process are in the farmhouse, so to speak. The wheat has been grown in the forty acre and ground in the local mill. A clever housewife even makes her own yeast if she can only get a little to begin with, for half a cupful of old yeast must be added after the hops have been boiled and a little flour put in the dish. After the compound has stood for a day and a night, with the addition of potatoes and sugar, it is ready for use, and will keep for three months. No doubt baking day is a hard one for the women folk. From the time when it is "laid in" on Thursday night till late on Friday night, when the last loaf or the Sunday pie is taken out, there is hardly an idle moment. Early in the morning the dough has to get its first working, after which it is left till the afternoon, when it is divided into loaves and fired, while the intervening time is fully occupied with the nick-nacks to which reference has already been made. But the advantages are such as almost to make us regret that townswomen have lost the art of baking. The economy of it needs no proof. As Mrs. Poyser might say, the continual purchase of bakers' bread would be "ruination" in the country, where ready money is proverbially scarce. That it is pure, wholesome and clean is equally evident. In the eyes of experienced men, however, baking is most to be valued for its moral effect on the character of women. She who is ignorant of it is almost certain, whether she is rich or poor, to have a comfortless house. If rich, her servants are either thrown on their own resources or forced to follow mechanical directions. They do not feel that there is any clever working head directing them. If poor, her resources are the public oven, tinned meat, and the confectioner's shop. She is an expensive and not a very useful wife. For baking is the most fascinating and instructive of feminine pursuits. Stupid women, or those who have not the habit of concentrating their thought and energy upon it, bungle the business all their lives, their ovens never work well, and their dough does not rise, so that time after time the loaf is raw in the inside, as heavy as a Norfolk dumpling, and with a crust charred to cinders. The woman who develops a love of her oven becomes a treasure to her household and a pride to the country-side. It is not only for the sake of the home-made bread, but for the exploration into other fields of cookery into which she is drawn, until the confectioner is no more in it with her. Her puddings, pies and tarts for dinner, and her nick-nacks for tea, make the life of her husband a series of delightful surprises. If she has to do her own work, the pleasure of it "physics pain," and if she has servants, she lends a ten-fold pleasure to their lives by the infection of her enthusiasm and the interest of her inventions. Nor does the good wife grumble at her in-

struments. There is many an eminent Scotsman living to-day whose christening cake was baked in no oven at all, but in a huge three-footed pot, which was placed in front of the fire, and its lid covered with hot coals. Perhaps it may be said that this primitive method of baking is a very slight improvement upon the still older plan of covering the cake with hot ashes, but it is still in common use among the islands and in the northern portion of Scotland. The bride's cake and the New Year's loaf, besides those which are made for meetings and partings, for births and funerals, are all baked in the big pot. Nor are they so heavy as one might expect. But the Orcadian or Caithness man, when he takes a house, is not so particular as they are in Yorkshire or Cornwall about the oven. He needs only a wide fire-place, with a sway or crook for his girdle and frying pan. On the former of these are baked the oat cakes, which, except in some very poor districts where the barley bannock still prevails, forms the poor man's staple food. On the latter the dropped cakes and pancakes with which gossip regales gossip when she drops in to tea. It is a rare thing in rural Scotland to find a small house with an oven in it. As soon as we cross the Tweed, however, there is an entire change. The poorest tumble-down cottage has a large oven, with an independent fire, and though the girdle is still an essential part of the furniture, it is only used for the flour cake hastily prepared for the unexpected visitor. Yet it is very strange that no sooner do the rural inhabitants of England migrate into the large towns than they straightway forget all they used to know about baking. In spite of the lectures they receive on economy from one well-meaning person and another, they speedily forsake the domestic oven for the much less wholesome and far more expensive confectioner's shop. Whether this is owing to the innate laziness of human nature, or to want of time and other inconveniences which beset people in the midst of a large population, it would be difficult to say. That it is regrettable, however, is beyond dispute; and those who think so would be almost inclined to welcome any movement or combination the effect of which was to raise the price of the quartern loaf. It is not only that it would oblige the wives of working men to revive an art which they are losing, but this very revival would have many corollaries tending to make modest homes pleasanter and more comfortable than they used to be. The woman who bakes one light eatable loaf is certain not to stop there. This consideration places the bakers in a very delicate position. If they raise the price of the loaf beyond a certain point, many oven fires will be lighted never to be permanently put out again.—*London Standard.*

GENESIS OF DEATH.

COMPLEXITY OF ORGANIZATION FATAL TO THE PERPETUATION OF THE ORGANISM.

From the dawn of life the structures best adapted to surrounding conditions have been victors; whatever features have proved useful have been seized upon by natural selection and secured dominance. The enormous mass of the lower forms have persisted to this day, because the balance established between them and their surroundings has remained unaltered. But wherever the balance between living things and their surroundings has been disturbed new demands have been made upon them, to which they responded, or, failing that response, perished. Hence it is in the first complexity of structure, the first departure from simplicity, that the seeds of death were sown. For that death becomes a necessity. So far as its occurrence by natural causes is concerned, we know that as organisms get older (although this applies more to animals than to plants, in which the cells, as they become liquefied or converted into wood, are overlaid with new cells) their power of work and of renewal is lessened. The cells which form the vital fabric of tissues are worn by continual use; the waste exceeds the repair, and death ultimately ensues, "because a worn-out tissue cannot forever renew itself, and because a capacity for increase by means of cell division is not everlasting, but finite." Why there should be this limit to cell division we cannot say, but it is clear that with the modifications of organs according to the work which they discharge there results a subtler structure which is less easy to repair and is shorter of duration. The one-celled organisms have found salvation in simplicity. We are, therefore, driven to the conclusion that since there is, prima facie, no reason why growth should be limited or why function should come to an end, death must have been brought about by natural selection, which determines survival or extinction from the standpoint of utility alone. There needs no showing that it is to the advantage of the species that individuals should die. Their immortality would be harmful all round; nay, impossible, unless vigor remained unimpaired, and the multiplication of offspring does not overtake the means of subsistence. "For it is evident," as Mr. Russell Wallace remarks in a note which he has contributed to Dr. Weismann's essay, "that when one or more individuals have provided a sufficient number of successors, they themselves, as consumers of nourishment in a constantly increasing degree, are an injury to those successors. Natural selection, therefore, weeds them out, and in many cases favors such races as die almost immediately after they have left successors," as, *e. g.*, among the male bees, the drone perishing while pairing, death being due to sudden nervous shock.

COCOA.

THE CHARACTER AND COMPOSITION OF A POPULAR BEVERAGE.

The daily papers are filled with the announcements of various kinds of cocoa, called breakfast cocoa, pure soluble cocoa, Dutch cocoa, etc., for each of which the manufacturer makes special claims of superiority and purity. We have been repeatedly asked to explain the different claims made for each of these products, and therefore now proceed to do so. The word cocoa is properly spelled cacao. The article is made from the ground roasted beans or nuts of the chocolate tree, botanically called the *Theobroma Cacáo.* This tree grows in Equatorial America from the 23d to the 20th degree of latitude. The most valuable cacao beans come from Southern Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, and the Central American States. Inferior sorts come from Guyana and Brazil, and even the West Indies. The tree bears constantly, but the crops are generally gathered only twice a year. The pods are about 10–15 cm. (4–6 in.) in length and contain in five rows about 25 white beans, which in drying assume a brown color. These cacao-beans packed in bags and boxes are upon arrival at the factory hulled, cleaned, roasted and ground. The temperature to which cacao is exposed in roasting rarely exceeds 150 deg., and the roasting is done principally to dry the shell so that it will separate readily in cleaning, also to develop the aroma of the cacao. Cacao and chocolate are excellent foods, as they consist largely of the three principal nutrients, besides which they are valuable for the alkaloids and aromatic oil they contain. Sir James Bell gives the following analysis of the cacao deprived of its shell:

Moisture	5.23
Fat	50.44
Starch	4.20
Soluble albuminoids	6.30
Insoluble albuminoids	6.96
Astringent principle	6.71
Gum	2.17
Cellulose	6.40
Alkaloids	0.84
Coloring matter	2.20
Insoluble organic matter	5.80
Ash	2.75
	100.00

What is known as cocoa butter is extracted from the shelled nuts by pressing between warm rollers. This cocoa butter is a mixture of glycerides with oleic, lauric, palmitic, stearic and arachinic acids, and does not get rancid. Commercially, cacao is found, 1st, as cacao mass, which is the ground bean after having been roasted, shelled and cleaned, 2d, as cocoa or soluble cocoa, which is the cocoa mass, from which the greater part of the cocoa butter has been pressed. Much of this so-called soluble cocoa is mixed with soda or potash and magnesia to make it more soluble. Chocolate is a mixture of shelled cocoa, ground with sugar and spices or flavoring added, that is what it should be, and in Germany even the addition of starch or the extracting of the cocoa butter is forbidden unless it is plainly so stated on the wrapper. There is hardly a substance more adulterated than cocoa and chocolate, the strictly pure being the exception. The principal adulterations are, starch, foreign fats (such as tallow), cocoa shells, and mineral substances. Among the starches employed for adulterating are flour, corn meal, rice, potatoes, acorns, tapioca, curcuma, sago, peas, beans, lentils, chestnuts, chicory, hard tack, and even bran. The valuable cocoa butter is frequently extracted and substituted by tallow, marrow, lard, olive, sesame, cocoanut, almond, mustard, peanut or cottonseed oil or wax. Cocoa mass is left out and cocoa shells used. The mineral substances used for adulterating purposes are employed to add weight or restore color, and consist of plaster-of-Paris, terra alba, sand, chalk, lime, brick dust, red ochre and even cinnabar. Instead of honest flavoring these adulterators use æthers and add pulverized mahogany or cedar wood and replace vanilla with balsam of Peru or tolu, or gum benzoin. The chemical analysis of cocoa and chocolate is a very laborious, difficult and expensive task, yet we hope in an early number to give our readers the benefit of some analyses made specially for the AMERICAN ANALYST by our chemist.

FEMININE BUDDHISTS.—Buddhism is spreading to a considerable extent among the female graduates of the universities and other young people of culture in Europe, and the fact is being laid at the door of Max Muller, who is charged with having first brought that religion to the attention of the Christian world. His defenders say that the converts are made chiefly by Hindoos who come from India to attend the universities.

LAST YEAR'S IMMIGRATION.—Ninety-three thousand Englishmen, 57,000 Irishmen, and 17,000 Scotchmen emigrated to the United States in 1889; 22,000 English, 2,000 Irish, and 3,000 Scotch went to Canada; 23,000 English, 2,000 Irish, and 2,000 Scotch went to Australia; while to "all other places" went 24,000 English, 2,000 Irish, and 1,000 Scotch. The totals for the year show 164,000 English emigrants, 64,000 Irish, and 25,000 Scotch.

SMOKELESS POWDER.—During recent German maneuvers it was found that with bodies of troops 400 yards apart, one body in the woods, the sound of their firing could be heard, but there was not smoke enough to locate them accurately for a return fire to be effective. It is suggested that the balloon will become necessary for reconnoisance in such cases when smokeless powder comes to be generally used.

RISKS OF CHLOROFORM.—A commission of experts of the highest standing employed by the Nizam of Hyderabad to investigate the use of chloroform as an anæsthetic has just made a report, in which it declares that the danger from the chloroform is not to the heart, as is generally supposed, but to the lungs. It says: "However concentrated the chloroform may be, it never causes sudden death from stoppage of the heart. * * * Chloroform has no power of increasing the tendency to either shock or syncope during operations. * * * The truth about the fatty heart seems to be that chloroform *per se* in no way endangers such a heart, but, on the contrary, by lowering the blood pressure, lessens the work that the heart has to perform, which is a positive advantage." The practical conclusions of the commission are that the safe administration of chloroform depends on careful attention to the respiration. Care must be taken that it is not interfered with, and if by any accident it stops, artificial respiration must be instantly begun. Rules on this subject are given, by constant attention to which the commission asserts that chloroform can be given with perfect ease and absolute safety.

BOGUS LIQUORS.

A REPORT FROM CINCINNATI OF AN EXTENSIVE COUNTERFEIT TRADE.

In the last issue of the AMERICAN ANALYST was reproduced a description of a concern in this city, which, when the sketch was originally published by us a few years ago, was engaged in the fraudulent manufacture of artificial wines and liquors. The subjoined account of a similar nefarious enterprise in Cincinnati, is taken from the *Enquirer* of that city of January 12:

It is not generally known that Cincinnati is the headquarters in this country of the imitation liquor traffic. The largest house in the business is located here, and its products go almost everywhere. No one who has not thoroughly investigated the matter can have any idea of the extent of the counterfeiting. It is a bold thing to say, but the quantity of the genuine is comparatively small with that of the bogus, and so perfect are the imitations that they baffle the experts. In other words there is no way to distinguish the genuine from the thing it purports to be. Both have the same appearance and characteristics, the same effects, and chemical analysis finds them to be identical. While the imported is an expensive article and the imitation can oftentimes be produced for one fifth the cost, yet the difference in the price to the public is very slight. The imitation sells for nearly as much as the genuine, and the purchaser is none the wiser, he accepts the assurance of the dealer that he is getting the real thing, but at lower rates than generally given the trade. The manufacturer of the bogus stuff appeases his conscience—if he has one—with the reflection that it is a harmless deception, and that in fact, the imitation is fully as good as the imported. Immense fortunes have accumulated from handling the bogus brands, and it is impossible to surmise the extent and importance of the business. Dealers, who handle very little else beside the counterfeit, deny of course that they have anything to do with it. Nevertheless they will not permit an inspection of their premises, and a cursory examination of their establishments would reveal the drugs and chemicals used in the compounding of the bogus liquors. Worse yet, the deception is practised by firms well known to the trade and whose standing and prominence ought to be a guarantee of protection to the purchaser. There's not a popular brand of whiskey, an imported brandy or standard cordial which cannot be reproduced by these manipulators of chemicals, and with such perfection that it is impossible for anybody to detect the deception. They can duplicate a twenty-year-old whiskey in less than as many minutes. A single drop of their preparation will give a year's age to the liquor. They can make blackberry cordial, which is so popular with housewives, simply with chemicals, never using a single blackberry. The swell who goes up to the fashionable bar and smacks his lips over the high-priced cognac, never dreams that it is a clever imitation that is tickling his palate and making the blood course through his veins. The devotee of the dangerous absinthe would laugh at the very idea if told that his "drip" was merely a mixture of chemicals. Four men may sit down to a table. One may drink bourbon, another rye, a third Irish, and the fourth Scotch whiskey. In the inspiration which naturally follows they will probably descant on the delightful bouquet and effects of their favorite beverages. But as a matter of fact they have all drank the same stuff. With a slight difference only in the coloring and flavor. So it is with vermouth, anisette, curacoa, kimmel, maraschino, chartreuse and all the standard cordials. Neither does gin escape the imitator. With a slight change in the amount of the flavoring essence, he can produce either Holland or Old Tom, with the fullest assurance that the deception will fool the most expert imbiber. Native wines are in the same way turned into imported claret, Madeira, sherry and old port. The manufacturer will vehemently claim that any of these imitations are as good as the genuine, and will back it up with some very strong arguments.

The base of these manufactured liquors is cologne spirits, which is nothing more than redistilled alcohol. From the distillation of highwines comes the alcohol, and a second stage of purification produces the cologne spirits. This latter liquor is perfectly odorless and colorless. It contains the fiery intoxicating quality, and from it can be produced any brandy, whiskey, cordial, rum, gin or wine known to the trade. This is done by the simple addition of certain oils or essences. As, for instance, to make cognac brandy, cognac oil would be put in the cologne spirits. Then there are mixtures to give the proper coloring, and head oil to put on top the little globules and give the smooth taste which the confiding public accepts as a proof of age. The change from the cologne spirits to the finest imported brand is therefore a matter of only a few seconds' stirring. The compound instantly assumes all peculiarities of the genuine. All naturally-made liquors, or what are termed straight goods, contain certain odorous ethers. The chemist reproduces these ethers artificially. He may take them from the product from which the straight liquor is made or else he may find them more accessible in something else. The dealers in these essences and oils have accommodatingly prepared little books of recipes and directions for the use of those engaged in the liquor counterfeiting trade. This printed information is, however, very zealously guarded, and never given out to those who might prove traitors to the manufacturer. In fact, there is between the maker and the user of the compounds a tacit understanding, something like that which exists between the counterfeiter and the "shover of the queer." Among themselves it is politely termed "a secret of the trade." Not all the imitation oils and essences are made in this country. On the contrary, they are produced in large quantities in Germany, France, England and other European countries. This fact is also an indication that much of what comes here as the really genuine is nothing more than a foreign imitation. So the seeker for truth is beset on all sides with tricks and traps. The American imitators, however, have to a great extent circumvented the foreign frauds by having Congress place a very heavy tariff on the latter. Some idea of this almost prohibitory legislation may be obtained from the fact that the duty on cognac oil is $100 per pound. The essential ingredient in brandy is œnanthic ether, which has a pungent, sickening odor, and is very perceptible in absinthe. The cognac oil is a greenish-looking fluid. A bottle left uncorked for a few seconds will fill the room with the sweetish smell. To show how easy "imported" cognac can be made it is only necessary to refer to the little book of "Hints to Liquor Merchants." An ounce of oil is dissolved in four pints of alcohol. This mixture is then added to eight barrels of cologne spirits. Next are put in twelve pints of sugar syrup or glycerine and two pounds of sugar coloring. Four ounces of bead oil will give the proper age and consistency, with the smooth oil taste. The result is 352 gallons of brandy, indistinguishable from the finest imported cognac. Cologne spirits cost about $1.10 per gallon, or $352 for the eight barrels. A good article of cologne oil can be obtained for $5 per ounce, the amount used in the present case. The coloring is quoted at $2 to $4 per gallon, two pounds costing $1 at the higher figure. The glycerine or syrup will cost about $6. At these figures the eight barrels of imitation will cost $364. Good imported cognac costs from $6 to $8 per gallon, and eight barrels would cost from $2,112 to $2,816. In other words, the cost of the genuine is six or seven times that of the imitation. When it is considered that the prices of the two commodities to the trade closely approximate, some idea might by gathered of the immense margin for profit. Another imitator gives as his recipe. To forty gallons of colored spirits add two ounces of brandy oil, mix well and add one quart of white syrup or glycerine. To imitate any particular brand, add a small quantity of the kind to be imitated, in the proportion of three gallons to forty. To make either bourbon, rye, Scotch or Irish whiskey, take forty gallons of the spirits and one quart of glycerine, adding two ounces of rye or bourbon oil, as the case may be, or four ounces of Scotch or Irish oil. Some manufacturers use five gallons of the real whiskey to thirty-five of the spirits. To give age an ounce of raisin oil is sometimes put in one barrel of whiskey. The coloring is used as desired. The actual cost of a gallon of either the rye or bourbon whiskies is $1.90 and of the Scotch or Irish $2.65. Apple brandy is imitated by taking forty gallons of spirits, four ounces of apple oil, one quart of glycerine and one pint of cider vinegar. Some genuine may be added to increase the deception. A quarter of a pound of peach oil, one pint of white syrup added to forty gallons of spirits and colored, makes peach brandy, at an actual cost of $1.16 per gallon. Cherry brandy is a compound of one quarter pound of the oil to forty gallons of spirits. Use syrup to suit taste; color and brighten with a few drops of carlot red. It is in making blackberry brandy that the beauties of the system are seen. To fifteen gallons of spirits add half a pound of blackberry essence, eight gallons of cheap port wine, five gallons of white syrup and twelve gallons of water. If a heavy-bodied brandy is wanted, omit half the sirup and supply its place with glucose. "It will make a fine article," says the manufacturer. One ounce of oil dissolved in a pint of alcohol and added to forty gallons of spirits will make a very fine Holland gin. When Old Tom is wanted, dissolve an ounce of the oil in one quart of alcohol, mix with thirty gallons of spirits, add two gallons of white syrup and eight gallons of water. Domestic gin, an article greatly used in the Philadelphia and Boston trade, is made by using half a pound of gin essence to forty gallons of spirits, with a quart of syrup added. Half a pound of the essence added to forty gallons of the spirits with one quart of white syrup, and properly colored, makes a very fine Jamaica rum.

Stoughton, Boonekamp, Angostura, and, in fact all the well-known bitters, are easily imitated. For Angostura take one pound of the chemical extract to a gallon of alcohol, mix into eight and one half gallons of spirits, and lastly, add half a gallon of white syrup. It was the manufacturer of these bitters that caused the recent raid on the Commerce Street establishment. In making maraschino, absinthe, curacoa, and anisette there are used twenty gallons of spirits, ten gallons of white syrup and ten gallons of water. This mixture can be flavored according to the cordial desired, with half a pound of maraschino oil, a quarter of a pound of absinthe oil and two pounds of curacoa or anisette essence. To make kimmel, a great drink among the German population, dissolve two ounces of the oil in thirty-two gallons of spirits. Mix well and add four gallons of white syrup and five gallons of water. Rhine wine is also readily imitated. One pound of the essence in three gallons of spirits is added to thirty-seven gallons of rectified cider. Then dissolve a pound of tartaric acid in half a gallon of hot water and add to suit the taste. Native wines are improved in flavor and bouquet so as to closely resemble the imported by adding claret, muscat, port or sherry oils in the proportion of two to four ounces to forty gallons. They were formerly used with rectified cider and spirits, but grape wines have become so cheap that the practice is seldom followed. Benedictine, which gained a world-wide reputation for the monks who made it, is one of the most frequently counterfeited of the cordials. Eight ounces of essence, dissolved in half a gallon of alcohol, is added with two gallons of syrup, to one barrel of spirits, and then colored. The same proportions are used in the imitation of Chartreuse.

On East —— Street, occupying Nos. —— —— a big four-story building, is the establishment of —— ——, who for over thirty years has been making the essences and oils above mentioned. It is recognised as the leading house of its kind in the country and the business has made all the firm very wealthy. If their books could be thrown open it would startle the public to see what prominent firms are among their customers. The visitor is confronted at the door with a sign, "Posi-

tively No Admittance," and his entrance into the office is regarded with suspicion until his mission is satisfactorily explained.

An *Enquirer* reporter dropped into the establishment the other day and with an effort to assume the character of a liquor merchant, carelessly inquired for a price list. Mr. ——, the youngest member of the firm, handed the reporter one of the little books.

"What's your firm?" he inquired.

"*The Enquirer* would like to publish an article—"

"Oh!" interrupted Mr. ——, and then quietly taking the book from the visitor's hand. "Let me see that again. there is nothing in it of course that we would object to any body knowing, but we wouldn't care to have you make use of it. Besides I will tell you all there is in it."

Mr. —— then chatted at some length in a seemingly candid way.

"It's one of the secrets of the trade" he said, and, really, an open one. Still, we don't desire newspaper notoriety. We have been written up once or twice and don't care about any more. Nearly all whiskey dealers use the imitation, but I would say that most of our trade is out of the city, in the South where cordials are more generally used. We have been in business since 1855, and for the first ten years we made a great deal of money. It was war times then, people didn't care how much they paid, nor we how much we charged. There is not so much money in it now, and really if it were not for the high duty on the imported we would be compelled to go out of business and move to Germany. Everything is so much higher over here—labor, apparatus, and material. The explanation of the business is simple. Chemists discovered that in liquors there are certain ethers which give them their particular taste and bouquet. These ethers are found in the original substance and extracted—like, for instance, they take the juniper berry and extract the oil, which is the distinguishing ingredient in gin. Or take rum. The oil is extracted from the sugar-cane and so on with the various cordials. As the base of all these different liquors cologne spirits are used. These spirits are simply perfectly purified alcohol, or alcohol which has been redistilled until all the fusel-oil has been taken out. This fusel-oil, you know, is the poisonous thing in whiskey. In the imitation you will find none of it, so that as a matter of fact, the imitation whiskey is less harmful than the genuine made under the old method. What difference is there if by science we take a short cut and make a thing the same or better than that made by the slow process of fermentation? Both have the same ingredients in the same proportion. It's as broad as it's long. Then it was discovered that with the addition of certain harmless oils—beading oil and rasin oil—we could give the liquor the appearance and taste of age. Next followed the imitation of the coloring. This is done merely with burnt sugar, which is tasteless and odorless. Here's some now. You can try it."

Mr. —— took up a small graduate containing a black slicky mass. Taking a little on a glass rod he stirred it in a glass of distilled water. In a few seconds the water assumed a rich brown color, but a sip showed that it had undergone no change in taste.

"You see there can be no harm in that. The least bit of it will color a whole barrel."

"Then such brands as Hennessy's imported brandy are generally imitated."

"Why, yes. You might say that every house makes its Hennessey. Some member of the firm imagines he has a boy named Hennessey, and names it after him. So it is with McBrayer and other noted whiskies. And really the imitation is better than the genuine, for it contains less fusel-oil. It is absurd to say we use sulphuric acid or other deleterious things, for the reason that if we did they would ruin the other ingredients. They couldn't be combined. It is the spirits that cost most in these compounds. While the oils are expensive, yet very little is used, as half an ounce will do the work for a whole barrel."

"Then why does the imitation sell so high when it can be made so cheaply?"

"Well," replied Mr. ——, with a laugh, "I was in Philadelphia once, and a customer asked me what made my prices so high. I replied, the profits. We used to sell a great deal of coloring and flavoring extracts to cigar dealers, both in this country and Cuba, but do very little in that line now. Really it is only the cheapest cigars that are doctored."

"What about cognac brandy?"

"That is imitated as much and as easily as anything else. The cognac oil or essence comes from the grape skins, and is readily extracted. Of course, in all these mixtures it is the spirits that intoxicate. You might drink an ounce of the cognac oil and it wouldn't have any effect, except possibly to make you sick at the stomach."

"And Angostura bitters?"

"Now you are referring to that raid on the Commerce Street firm. I never heard of them until I saw the account in the paper. Well, the trouble with them was that they used the genuine bottles and labels. Nobody can be troubled if they make it by the barrel."

After leaving Mr. ——, the reporter ran across a well known whiskey dealer, who prides himself on handling nothing but straight goods.

"These imitations," he said, with great indignation, "are outrageous brands. They say they are harmless. Take the men who drink fine old whiskies and you'll find men who live to be 80 years old. Go down among the dives and look at the bums who are poisoned with the bogus stuff. The fraud lies also in the fact that the saloon keepers are deceived as much as the public. They think they are buying the genuine, and pay accordingly."

"Why, can't dealers in liquor tell?"

"Certainly not. The imitation is so perfect that even experts are baffled. No one can tell the difference by merely tasting or looking at it. The only test is in the effects. These men are very shrewd. They went before Congress in 1883, after the Tariff Commission had gone through the country, and, pleading that the matter had been overlooked, got the very high duty on imported stuff still greatly increased. An imported brandy that sells for $8 they can make for about $1.20, an imitation which contains no grape juice, and which, when used in a physician's prescription, is directly contrary to what is intended."

Carl Langenbeck, the well-known chemist, was next seen. When several unlabeled vials containing oils secured from Fries & Bros. were placed before him, he took a whiff of each, and smiling replied that he could very closely tell their contents without making an analysis. All of them contained ethers, which were very pungent, and could be readily detected by their odors. The cognac oil showed very perceptibly the presence of œnanthic ether. The beading oil was what is termed in chemistry a "soap." It might be called "ammonium soap."

"Are these ethers poisonous?"

"Yes; in sufficient quantities they would kill, but they carry their own safeguards with them. A half ounce of pure œnanthic ether is so painful that if you tried to smell it, it would knock your head off. The odor would drive people out of the house. So you see a very minute quantity has to be used to give the proper flavor. Indeed that is the trouble. Nature's laboratory is so perfect in its work that it is a hard matter to duplicate its products. These essences are blended in such minute quantities that it is well nigh impossible to make the correct proportions without most perfect measurement."

"How do they get these oils? The gin from the juniper berry, and the blackberry oil from the blackberry?"

"Not necessarily. These ethers are found blended together in many things. The same ether that seems to control in the juniper might be found in something else, from which it could be more easily extracted. The same with the blackberry and the rest. As a chemist, I could not say these imitations are more harmful than the genuine, and technically they might be purer. The fraud lies in the deception of the public, which has a right to get what it asks for. Foreign governments regard all these things adulterations without any question as to their effects. For instance—and it is done a great deal in this country and in this very city—sausage is adulterated with potato starch, which readily absorbs water and gives weight, while costing not a fourth as much as meat. Frequently 50 per cent. of the starch is used. It doesn't amount to so much in this country, but in the old countries, where the workingman gets very little meat, it is a big item to him if he is defrauded out of a part of his nourishment."

"Can chemists detect these frauds in liquors?"

"No. Analysis of the imitation will show it has the same ingredients as the genuine, and probably in the most exact proportion of minute quantities. The superiority of the genuine lies in the perfect blending made by nature?"

"And the age?"

"You know that in this country they burned or charred the inside of the barrels, and it was found that in time the liquor absorbed the coloring and became smoother. This result is now duplicated by the use of burnt sugar, used in quantities necessary for the proper shade. In the old countries they never charred the barrels, and so the whiskies have always been perfectly colorless, like our moonshine. People here got to recognize that very old liquor had on its top little bubbles, and this led to the use of the beading oil. One great ground of complaint is that the public is deprived of its tests of the genuine. By that I mean that certain characteristics can be so perfectly duplicated that the imitation cannot be detected from the genuine. In the old countries the governments try to preserve to the people these simple standards by which they determine the genuine."

Use of the Phonograph.—The use of the phonograph in connection with typewriting is making progress in this city. A firm of young women has opened an establishment in Broad Street, with the view of making a specialty of transcribing by means of typewriters dictation on the phonograph. This method dispenses with the services of a stenographer.

Military Bicyclists.—Cycling has become regularly a part of the British light infantry work at several stations in England, and will be more generally introduced.

Heavy Rudder.—The British ironclad, Vulcan, which is being built now, is having put in a rudder weighing twenty-two tons, the largest ever put on a British vessel.

Cheerful Prospect.—A French woman has got up a public contest, the proceeds of which are to be devoted to the relief of the sufferers from the Antwerp fire, in which the prize is to be awarded to the woman who speaks the most words in an hour.

Life in Russia.—Bears and wolves have become such a nuisance this winter in the Department of Orel, in Russia, that the military have been asked to turn in and help hunt them. They have invaded the farms almost nightly and carried off cattle from the barns.

Discriminating Providence.—It is remarked as a singularly thoughtful dispensation of Providence in London that the influenza attacked most frequently and severely those who were at work on salary, and that those who worked by the piece or day were either spared entirely or had light attacks. "Tempering the wind to the shorn lamb" is what one paper calls it.

The Passion Play.—The passion plays at Oberammergau are to take place this year on the following days: The first performance, Whit Monday, May 26th, and the others—twenty-four—for the 1st, 8th, 15th, 16th, 22d, 25th, and 29th of June; the 6th, 13th, 20th, 23d, and 27th of July; the 3d, 6th, 10th, 17th, 20th 24th, and 31st of August, and the 3d, 7th, 14th, 21st, and 28th of September.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

February.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, pork.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, geese.

FISH.—Bass, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish.

VEGETABLES.—Artichokes, beets, beans, cabbage, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, tomatoes, turnips.

FRUITS.—Apples, bananas, grapes and oranges.

PRACTICAL RECIPES.

ROAST LEG OF VENISON.—Select a good piece of the leg, weighing about two and a half or three pounds; cut it open and take out the bone; then with a blunt knife pierce it all over the inside and lay it in a baking pan. Cut a quarter of a pound of bacon into slices, and try out all the grease; take from the fire and, while boiling, pour it into the meat; sprinkle plentifully with salt and pepper, fold and tie, and bake in a good oven, basting often.

CREOLE GUMBO.—Put in a kettle of boiling water equal portions of beet leaves, cabbage leaves, turnip leaves, mustard leaves, spinach, cresses, parsley, young onions. When well boiled, drain and chop fine. Make a brown gravy, in which you put some beef and a little ham; let it fry a little; then add the vegetables; stir often and let them fry for an hour, keeping the pot well covered; then add enough hot water to make the required quantity, and let it boil gently for about two hours; season, making it quite hot with red pepper.

PARSNIP FRITTERS.—Boil six large parsnips; peel and split and cut them into pieces. Make a batter with one pint of milk, four eggs, four tablespoonfuls of flour. Have some lard boiling in a frying pan; take a large spoonful of batter for every piece of parsnip; drop into the boiling lard and, when nicely browned, drain and serve immediately.

RICE WAFFLES.—Rub through a sieve one pint of warm boiled rice, add to it a tablespoonful of dry flour, two-thirds of a teaspoonful of salt, two teaspoonfuls of Horsford's baking powder. Beat separately the yolks and whites of three eggs; add to the yolks three gills of milk; work it into the flour; then add an ounce of melted butter; beat the whites of the eggs thoroughly; mix the whole together. Heat the waffle iron and grease it evenly—a piece of salt pork is best for this purpose; pour the batter into the half of the iron over the range until nearly two-thirds full; cover, allow to cook a moment, then turn and brown slightly on the other side.

ALMOND PUDDING.—Blanch one ounce of bitter and one-quarter pound of sweet almonds and pound them to a paste in a mortar; add a few drops of rose-water while pounding. Stir one-quarter pound of butter and one-quarter pound of sugar to a cream. Beat well the whites of six eggs; stir the almonds and beaten eggs alternately into the butter and sugar. Line a pie dish with puff paste, pour in the mixture, and bake in a moderate oven half an hour. Sprinkle with sugar, and serve.

MACARONI.—Make a good gravy with a small piece of beef cooked with some vegetables, herbs, and a slice of ham; strain and add a little tomato sauce. Cook some macaroni in salted boiling water until tender; drain; put it in a baking dish with layers of Parmesan cheese and the gravy. Sprinkle cheese and a little butter over the top; bake, and serve at once.

GINGER BREAD.—Three-quarters of a pound of butter, two and a half pounds of flour, one quart of black molasses, two teaspoonfuls of ginger, two teaspoonfuls of cinnamon, eight eggs, two teaspoonfuls of soda.

WASHINGTON AND HARRISON.

MAGAZINE TRIBUTES TO TWO EMINENT LADIES OF THE WHITE HOUSE.

Marion Harland, the friend and helper of women everywhere, has taken up the work of restoring the ruined monument marking the burial-place of Mary the Mother of Washington. One hundred years ago this venerable woman was interred in private grounds near Fredericksburg, Virginia. In 1833 the corner-stone of an imposing memorial was laid by President Andrew Jackson. A patriotic citizen of New York assumed the pious task, single-handed, but meeting with financial disaster, was compelled to abandon it. Marion Harland says truly—in her appeal to the mothers and daughters of America to erect a fitting monument to her who gave Our Country a Father—that "the sun shines upon no sadder ruin in the length and breadth of our land than this unfinished structure." The publishers of *The Home-Maker*, of which Marion Harland is the editor, offer, as their contribution to the good cause, seventy-five cents out of every annual subscription of two dollars to the magazine sent in during the next six months. Every such subscription must be accompanied by the words, "For Mary Washington Monument." The offer is generous, and should meet with an enthusiastic response.

The brother of President Harrison's private secretary, Mr. A. J. Halford, has written for the March number of the Philadelphia *Ladies' Home Journal* an article on "Mrs. Harrison's Daily Life in the White House," prepared with the consent and assistance of Mrs. Harrison. A new portrait of the lady of the White House, especially taken for this article, and a view of the up-stairs family rooms of the executive mansion, are among the illustrations which will accompany Mr. Halford's first magazine effort.

FAITH FOLLIES.

CURRENT EXPOSURES OF CRIMINAL CHRISTIAN SCIENCE.

A Faith Cure Church.

The First Independent Faith Cure Church of Jersey City was organized yesterday in the building formerly occupied by the Church of the First Born in Erie and Sixth Streets, by the Rev. William Albert Philips, who used to be pastor of the Elsey Memorial Church on the Hill. The church is independent of all the other Faith Cure churches in the city. There were three services held yesterday. Mr. Philips conducted the one in the morning and a testimony meeting in the afternoon.—*Sun, February* 3.

Extirpate the Fraud.

The last case of murder under the name of "Christian Science Treatment" has aroused so much indignation in Massachusetts that stringent legislation will be brought to bear to extirpate what is, without question, one of the most pernicious frauds and delusions that a community has ever been cursed with.—*Buffalo Advertiser.*

PHILANTHROPIC BEQUEST.—A searcher among old deeds and records in London recently came across a statement that Mr. Samuel Wilson bequeathed a sum of £20,000—which has considerably increased—"to be lent to men who have been set up one year, and not more than two years, in some trade or manufacture in the city of London, or within three miles thereof, and who can give satisfactory security for the repayment of same." It has not been claimed for many years.

PNEUMONIA.

This disease, which has been so prevalent and fatal lately is not, as many may have erroneously supposed, a new disease; but the name is only a more accurate word for inflammation of the substance of the lungs, and was called in former years hasty, or galloping, consumption. It manifests itself in several forms, which differ from each other in their nature, causes, and results, viz.: (1) Acute croupous or lobar pneumonia, the most common form of the disease, in which the inflammation affects a limited area, usually a lobe or lobes of the lung, and runs a rapid course; (2) catarrhal pneumonia, broncho-pneumonia, or lobular pneumonia, which occurs as a result of antecedent bronchitis, and is more diffuse in its distribution than the former; (3) interstitial pneumonia, or cirrhosis of the lung, a more chronic form of inflammation, which affects chiefly the framework or fibrous stroma of the lung and is closely allied to phthisis. Acute croupous or lobar pneumonia is the disease commonly known as inflammation of the lungs. It derives its name from its pathological characters, which are well marked. The changes which take place in the lung are chiefly three: (1) congestion, or engorgement, the blood vessels being distended and the lung more voluminous and heavier than normal, and of dark-red color. Its air cells still contain air. (2) Red hepatization, so called from its resemblance to liver tissue. In this stage there is poured into the air cells of the affected part an exudation consisting of amorphous fibrin together with epithelial cells and red and white blood corpuscles, the whole forming a viscid mass which occupies not only the cells but also the finer bronchi, and which speedily coagulates, causing the lung to become firmly consolidated. In this condition the cells are entirely emptied of air, their blood-vessels are pressed upon by the exudation, and the lung substance, rendered brittle, sinks in water. The appearance of a section of the lung in this stage has been likened to that of red granite. It is to the character of the exudation consisting largely of coagulable fibrin that the term croupous is due. (3) Gray hepatization. In this stage the lung still retains its liver-like consistence, but its color is now gray, not unlike the appearance of gray granite. This is due to the change taking place in the exudation which undergoes resolution by a process of fatty degeneration, pus formation, liquefaction, and ultimately absorption, so that in a comparatively short period the air vesicles get rid of their morbid contents and resume their normal function. This is happily the termination of the majority of cases of croupous pneumonia, yet it occasionally happens that this favorable result is not attained, and that further changes of a retrograde kind take place in the inflamed lung in the form of suppuration and abscess, or of gangrene. In such instances there usually exists some serious constitutional cause which contributes to give this unfavorable direction to the course of the disease. Further, pneumonia may in some instances become chronic, the lung never entirely clearing up, and it may terminate in phthisis. Pneumonia may be confined to a portion or the whole of one lung, or it may be double, affecting both lungs, which is a serious and often fatal form. The basis or middle of the lungs are the parts most commonly inflamed, but the apex is sometimes the only part affected. The right lung is considerably more frequently the seat of pneumonia than the left lung. Catarrhal or lobular pneumonia differs from the last in several important pathological and clinical points. Here the inflammation is more diffuse, and tends to affect lobules of lung tissue here and there, rather than one or more lobes, as in croupous pneumonia. Chronic interstitial pneumonia, or cirrhosis of the lung, is a slow inflammatory change affecting chiefly one portion of the lung texture, viz.: its fibrous stroma.

Of course, where pneumonia has once set in a physician should be called in immediately, but as pneumonia is generally preceded by bronchitis or even a common cold, as has been frequently the case with patients suffering from the "grippe," one ounce of prevention is worth a pound of cure. This great preventive is Dr. J. C. Ayer's

Cherry Pectoral, which, if administered according to directions, will quickly relieve and cure even the most aggravated cases of bronchitis. It is a preparation put up on a physician's prescription by the well-known firm of J. C. Ayer & Co., of Lowell, Mass., and has won for itself the full approbation of all who have ever used it.

MANY MUMMIES.—It has been estimated that more than 400,000,000 human mummies were made in Egypt from the beginning of the art of embalming until its discontinuance in the seventh century. Herodotus and Diodorus agree in the statement that there were three grades of embalming. The first cost about $1,225, the second about $375, and the third was very cheap.

ANCIENT TELEPHONES.—Telephones and speaking tubes are of greater antiquity than most persons are aware. The speaking tube is a contrivance mentioned in ancient writers, and comes down to us or survives just as candles and oil lamps have not been altogether superseded by gas and electricity. In 1667 Robert Hooke, of London, described how he transmitted sound by means of a wire to considerable distances. Wheatstone described his "telephone" in 1821, and in 1854, Ch. Bourseul said: "Suppose a man speaks near a movable disk sufficiently pliable to lose none of the vibrations of the voice, that this disk alternately makes and breaks the currents from an electric battery, you may have at any distance another disk which will simultaneously execute the same vibrations. It is certain that in a more or less distant future speech will be transmitted by electricity."—*Electrical Review.*

DANTE JUBILEE.—"A love jubilee" is the latest celebration devised. On the occasion of "the sixth centenary of the loves of Dante and Beatrice" a grand demonstration in honor of the tender passion will be held at the Politeamo at Florence, and will be kept up for five weeks, beginning with the 1st of May. There will be an exhibition of the great works of the greatest women; a series of tableaux vivants, reproducing the principal scenes of the "Vita Nuova;" and a conference on love at which papers will be read. A prize is offered for the most eloquent discourse, and the competition is open to all comers. Of course there will be portraits of Dante and Beatrice, and a complete collection of books about them.

BUFFALO DISAPPEARING.—The next Legislature of Wyoming will pass a law making the killing of a buffalo a misdemeanor. An act to this effect is not required to protect the buffaloes as game, for the hunter would hunt the mountains and plains for wild buffaloes in vain. It is intended to apply to the men who lie in wait and shoot down the buffaloes that happen to stray off the reservation in the Yellowstone Park, where a few relics of the by-gone race are preserved. A dead buffalo brings its slayer $200 and the temptation to kill them is a strong one for the hunter. The animal alive is almost invaluable, and only a few years ago they were killed in mere sport by the thousands and left a prey to the wolves and buzzards on the plain.

Subscriptions $1 per year Now is the time to subscribe.

A Precious Globe.—The Shah of Persia is having a geographical globe made upon which the different countries of the world will be represented by precious stones. France will be indicated by sapphires, England by rubies, Russia by diamonds, and so on. All the seas will be represented by emeralds.

Female Journalists.—Two English ladies, the Misses Emily and Georgiana Hill, of Westminster Bridge, London, have opened a school for women journalists. The Misses Hill edit the *Westminster and Lambeth Gazette*, and are among the very few journalists of their sex in Europe. They intend to teach typesetting, shorthand writing, proof-reading and reporting.

Who was your Great Grandfather?—The *Detroit Journal* desires to receive, by postal card, the address of all living male and female descendants of Revolutionary officers and soldiers of 1776, and, when possible, the name and state of the ancestor. Wonder if the proprietor of the *Detroit Journal* is contemplating a raid upon the national treasury?

BUSINESS NOTES.

GORDON & DILWORTH.

Whether it be preserves, jams, olives, olive oil, catsup, or any other of the innumerable list of goods put up by this firm, their tasty, neat packing and attractive label positively guarantee the quality and purity of the goods within. Try these goods as you may—and we have done it repeatedly—you will never find any adulteration, not even preservatives, used. This is a specially advantageous feature in catsups—an article in which there is so much competition that, in order to cheapen it, all the waste and half-decayed fruit of canning factories is utilized, and their further decomposition stopped, by using large quantities of salicylic or benzoic acid, both of which seriously impair digestion. Gordon & Dilworth do not put up such catsup.

AS A NERVE TONIC,

use Horsford's acid phosphate. Dr. S. L. Williams, Clarence, Iowa, says: "I have used it to grand effect in a case of neuralgic fever, and in uterine difficulties. Also, in cases where a general tonic was needed. For a nerve tonic I think it is the best I have ever used, and can recommend it most confidently."

Trivial Speculations.—It is stated as an interesting matter of history that had the electric telegraph been in existence in 1814 the great battle of New Orleans would not have been fought, as the Treaty of Ghent had been concluded fifteen days previous, on December 24, 1814. The news of this treaty of peace did not reach Washington until a month after the battle took place. Another interesting matter in connection with this is, that had the battle of New Orleans not been fought, Andrew Jackson would not have been famous.

AMERICAN ANALYST CLUB RATES.

	Regular Price.	Price including American Analyst.
American Rural Home	$1 00	$1 50
American Agriculturist	1 50	1 60
Art Amateur	3 50	4 00
Arthur's Home Magazine	1 50	2 00
Art Interchange	3 00	3 25
Babyhood	1 50	1 60
Ballou's Magazine	1 50	1 75
Cassell's Family Magazine	1 50	1 75
Century	4 00	4 25
Christian Herald, N. Y.	1 50	1 50
Christian Union	3 00	3 10
Cosmopolitan, N. Y.	2 40	2 50
Cottage Hearth	1 50	1 50
Country Gentleman	2 50	2 50
Current Literature	3 00	3 00
Demorest's Magazine	2 00	2 10
Family Story Paper	3 00	3 00
Farm and Fireside	50	1 00
Fireside Companion	3 00	3 00
Forum	5 00	5 00
Frank Leslie's Illustrated Newspaper	4 00	4 00
Frank Leslie's Popular Monthly	3 00	3 00
Godey's Lady's Book	2 00	2 25
Golden Days	3 00	3 00
Good Housekeeping	2 50	3 00
Harper's Bazar	4 00	4 00
Harper's Young People	2 00	2 25
Harper's Weekly	$4 00	$4 00
Harper's Monthly	4 00	3 60
Household	1 10	1 35
Housekeeper	1 00	1 25
Ladies' Home Journal, Philadelphia	1 00	1 50
Ledger, N. Y.	3 00	3 00
Lippincott's Magazine	3 00	2 50
National Tribune, Washington	1 00	1 50
New York Weekly	3 00	3 00
Our Day, Boston	2 00	2 50
Our Little Ones and Nursery	1 50	1 75
Outing, N. Y.	3 00	3 00
Peck's Sun	2 00	2 25
Peterson's Magazine	2 00	2 00
Popular Science Monthly	5 00	4 75
Puck	5 00	4 50
Rural New Yorker	2 00	2 30
Saturday Night, Philadelphia	3 00	3 00
Saturday Evening Post, Philadelphia	2 00	2 00
Scientific American	3 00	3 25
Scribner's Magazine	3 00	3 00
Vick's Illustrated Monthly	1 25	1 60
Wide Awake	2 40	2 60
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CONTENTS.

A TEMPERATE POLE.

In an interesting speculation upon the cause of the remarkable mildness that down to the present writing has characterized this winter, the *Press* ventures the somewhat startling suggestion that a change is going on in the relation of the earth to the sun. Our observant contemporary's idea is that one side of the globe is tipping up, so as to shift the plane of the ecliptic and bring us a little more nearly under the sun's direct rays. Two more or less plausible arguments are made in support of this hypothesis, and they curiously correspond, the one to the other. It is alleged that the atmosphere around the South Pole is certainly growing colder. Tales of voyagers reach our ears to the effect that a vast and rapidly increasing continent of thick ribbed ice is forming in the Antarctic Ocean. We are assured that explorers now find it impossible to approach anywhere nearly as close to the South Pole as was possible in former times. And there are people who claim that this stupendous accumulation of ice in that part of the world is disturbing the equatorial balance. Their idea is that the process there going on is both cause and effect. The heavier that end of the globe becomes the more the other end turns up to the sun, with the consequence of leaving the depressed end literally "out in the cold," and the colder it is the more the ice accumulates and the heavier the end becomes. In the second place, it is alleged that the atmosphere around the North Pole is growing warmer. Here we are able to look at the question with a little more confidence as to the facts, and are bound to admit that there are some signs which tend to bear out the ideas not under consideration. Chief among these are the icebergs. Never before did ships crossing the Atlantic encounter so many as this season. Now, it is a perfectly well settled fact that mild winters in the Arctic produce icebergs in the Atlantic and Pacific. The warmer it is up there the more bergs we have down here. It is the partial thawing and consequent disintegration of the crystal mountains of the north that sets the fragments free to float southward. Every geologist and paleontologist knows that what is now the frigid zone was once temperate or semi-torrid. The mammoth and the mastodon once lived, and could only find the food on which they lived in a climate like that which supports their degenerate successor, the elephant. Yet fossil remains of those extinct giant brutes are found in Siberia and Alaska. Another strong influential argument goes to show that the North Pole was once warm, and may therefore reasonably be expected to grow warm again. President Warren of Boston University published a few years ago a learned and ingenious book in support of the theory that the Garden of Eden was located at the North Pole. His reasonings were perfectly serious, and to many people entirely convincing. But it is evident that our first parents could not have lived comfortably there if the climate had been what it is supposed now to be, even after they began to wear figleaves.

INDIAN SUGAR.

We learn from the *Sugar Beet* that there are produced in India about two and a half million tons of sugar annually—an amount nearly equal to the present beet sugar production of Europe. The Indian article, however, is hardly up to the standard required for an export demand. While there are several refineries in India their methods of working are very crude. Nearly two million acres of land were, according to the last official report, under cultivation in sugar cane, and 14,000 acres in palm trees for the production of palm sugar. In certain parts of India, Calcutta for example, the consumption frequently reaches 100 pounds per capita, or greater than in England. The consumption is large during certain religious and marriage ceremonies. In former years, when bone black was in use, the export of beet sugar to India was difficult, owing to the use of food prepared with any animal product being prohibited by the religion of the country. Such being the case, our contemporary declares that, far from there being need for alarms respecting the future influence of India sugars upon the market, there is no possible reason why that country, with her several hundred millions population, should not be an excellent market for the surplus of Europe at present or America in years to come, made, as now, without the use of bone black.

CREMATION AND CRIME.

There is much that can be said in favor of cremation as a means of disposing of the human body after death, though a recital of the arguments in its behalf is hardly an attractive theme to dwell upon. Apart from all considerations of the subject likely to affect the sensibilities, it unquestionably has the warrant of antiquity, the prestige of Biblical example, and the approval of enlightened science. Against these and other arguments that might be cited, the burning of the dead appears to find its chief substantial opposition in the fear of lawyers that it may be used to defeat the ends of justice by obliterating the traces of murder, and especially those of poisoning—crimes that it is well known have frequently been revealed through chemical examination long after the date of their perpetration. It is obvious that cremation effectually deprives justice of that expedient. It also appears that for a like reason it may be held to conflict with the interests of life insurance. No company, we believe, has yet disputed a claim on this ground, and yet it can readily be seen that cases might arise where precipitate cremation would afford the insurer a legitimate cause of complaint, if not of repudiation. Such a case, for example, was the celebrated Dwight case in Binghamton, where the marks upon the person of the deceased formed a strong feature in the argument of the defendant companies. Cremation is not yet so universal as to cause the officials of any of our life insurance companies to lie awake of night from apprehension of fraud to be perpetrated through that source. But in this age when so much rascally ingenuity is devoted to cheating the underwriter, both life and fire, it behooves them to note and to provide against any additional source of danger.

TERRESTRIAL GROWTH.

There are visible indications of the physical growth of the earth as it constantly gathers the star-dust of the universe in its flight through space. This seems to be to a certain extent confirmed by the investigations of astronomers, who have published the results of their observations, and others who have given attention to this curious subject. Prof. Newton, of Yale College, has made some interesting calculations in this matter. He shows that the meteors which at any one place on the earth's surface can be seen, are in reality only one ten-thousandth part of the number that actually fall, every hour, upon the surface of the whole globe. This fact, in connection with observations made in Europe, makes the basis of an interesting conclusion. It is that

in every hour no fewer than 450,000 meteoric bodies fall upon the earth; and these include only such as would be visible to the naked eye. Of course they are mostly very small bodies, and the shower, distributed over so vast a surface, is unnoticed. Much, perhaps most, of the aggregate increase to the earth's substance comes in the form of impalpable dust, from exploded meteoric bodies or otherwise. The 'shooting stars' that one sees on almost any clear night by watching the sky, probably are resolved to a condition of dust before reaching the earth. Set on fire by the friction produced on entering the terrestrial atmosphere, these small bodies, rushing ever faster as they make the downward plunge, are 'all burned out' before they reach the surface. Can the aggregate amount of this imperceptible dust-shower really be enough to affect appreciably the bulk of the earth? If the calculations of investigators are not greatly at fault, that amount, when we consider that its production is unceasing, and that it was more abundant years ago than it is at present, must, in the course of time, have been sufficient to produce a great increase in the bulk of our globe. If Herschel's calculation was correct, it would follow that the globe receives, every hour, considerably over two tons of this outside matter, from the depths of space to swell its proportions.

TUBERCULOSIS FROM BEEF.

IS THERE REAL DANGER, AND CAN IT BE PREVENTED?

Public attention has been thoroughly aroused by frequent discussion to the very important question of the danger of contracting tuberculosis from eating meat or milk taken from tuberculous animals. We propose in the present article to collate such facts, from various sources, as we believe have been proven, and without further comment lay them before our readers to let them judge intelligently as to the probabilities, prevention and necessary measures of protection. That certain infectious diseases are common to both man and animals is well known to the practitioners both of human and of veterinary medicine. It is also known that the only possible chance of infection in certain diseases is through the consumption of meat which harbors the infecting principle; and that in many other diseases the flesh and milk of animals used for food, while not the only source of infection, yet play an important part in the propagation thereof. To tell people that inspection on the hoof would give them absolute safety, would be false, because the best authorities agree that in many cases the disease cannot be diagnosed in the live animal. To tell them, moreover, that the meat which they eat and the milk which they drink is, in the majority of instances, likely to convey infection, would be a gross exaggeration of the facts. A disease which costs more lives by far than any other, is tuberculosis, or what is commonly called consumption. One person in every seven born into the world dies of this disease; and probably one-third of the autopsies made upon persons dying from different diseases, including tuberculosis, will present lesions of this disease, either active or healed. It is a disease confined to no particular class of persons and bounded by no geographical limits. It is common to a greater number of species of animals than is any other disease known to medicine. In fact, it is quite probable that no species of animal living is absolutely immune or proof against its attack. Certain conditions of life, such as domestication in the lower animals, and the crowding together, and lack of sanitary precautions in the human species, undoubtedly favor its development. How often, however, do we see those comfortably housed and surrounded by all that wealth can procure, fall victims to its attack. Tuberculosis is due to a micro-organism known as the tubercle bacillus, first described by Koch in 1882. His work was so complete that no one has yet been able to add to it anything of importance. It is a bacillus, or rod-shaped object, about one-third as long as the diameter of a red blood corpuscle, and about one-tenth as broad as it is long. It has the property of resisting the action of acids. It grows slowly and only in certain media, preferably blood-serum and glycerine agar. These organisms are found in all the tissues in which the lesions are present and in the fluid from the affected parts. The organism is the same, no matter what species of animal it may affect. Dr. Henry Behrend, M. R. C. P., of London, has recently written a paper to prove that the rigid Mosaic laws are to be credited for the well known healthfulness and general immunity from consumption of the Hebrew race under otherwise unfavorable conditions. He says that, of 13,116 beeves slaughtered for the Hebrew trade in London in six months, only 6,973 came up to the peculiar Jewish requirements, and that the average rejections for five years had been 40 per cent. But these rejections are often considered good enough for the Gentiles in a trade way. As a moral to adorn this tale, he makes the astounding statement that in a large practice of over thirty years he had never met a case of consumption among the members of the Jewish faith! And he fortifies that statement with similar ones from other busy physicians. What a revelation this is! Shall we conclude that to be a Jew is to be impervious to consumption, that scourge of the civilized world? Shall we not rather play the part of wisdom by adopting some of his hygienic and sanitary precautions, in the hope that we, too, may come within the pale of similar immunity? Kosher meat, as the passed-inspection Hebrew meat is called, is thus prepared, under the supervision of the proper official, often the rabbi himself, certainly one familiar with pathological appearances: A perfectly sound and presumably healthy animal is selected and thrown and a keen sword-like knife, three feet long, is pushed once across the throat and then drawn forcibly back toward the operator, the animal then being hung up by the heels until thoroughly drained of blood. That oft-quoted jugular vein is, of course, severed, and so are the large arteries, by those terrible cuts, for the knife goes to the bone. Every organ is then carefully examined for traces of disease, especial attention being paid to the lungs, which must be non-adherent to the chest or each other in any lobe, and must be fully inflated, and then cut into and examined for foci of disease. The larger veins and arteries must then be dissected from the meat, for it is along them that abscesses are usually found, if found at all. If defect is found at any of these points, the meat is rejected as unsuitable for Jewish use. Poultry and fish have to pass a rigid inspection, and there are other stringent regulations regarding the treatment and cooking of even the passed-inspection food articles. We need not further particularize here, nor will we lengthen this article with easily quotable animal and meat literature, much of which is of a terrifically terrifying character. As the facts previously stated regarding consumption and meat have been indisputably proved such by the foremost scientists, we have now to inquire into the degree of immunity from danger we acquire by cooking our food. Comparing the Jewish immunity with ours, the question seems answered. For want of space, this point can not now be elaborated. Suffice it to say that Prof. Gerlach has cooked meat known to be tuberculous fifteen to thirty minutes, fed it to animals, and produced consumption in two-thirds of all those experimented on, while Prof. Bollinger of the University of Munich announces that tuberculous milk, even when boiled, will produce consumption. It has not been proven that the process of cooking, or the action of the digestive fluid will render it inert, and many of our best authorities are of the opinion that tuberculous meat or milk cannot be safely partaken of. Dr. Behrend's also adds the important statement, that the danger of tubercle in cattle is intensified by the fact that it is incapable of being recognized during lifetime, and is revealed only by a post-mortem examination of the organs implicated. Mr. Jenkins, Secretary to the Royal British Agricultural Society, as the result of years of experience concludes that tuberculosis cannot be detected during the life of the animal, unless almost at its last gasp. This unimpeachable testimony from two of the best authorities of England goes to show how futile such a live stock inspection law as was proposed in many States would be in protecting us against the greatest danger from our meat supply. It also proves that as the methods of our Chicago beef dressers are based on the very strict directions of the Jewish law especially as relating to the complete draining of the blood, those who use Chicago dressed beef may consider themselves safe from tuberculosis infection by eating meat.

CLOTHING AND COMMON SENSE.

SOME POPULAR FALLACIES REGARDING WHAT WE WEAR, CORRECTED.

A wave of dogmatical nonsense about clothing has passed over the land lately. One "authority" condemns winter clothing, as obstructive to perspiration and aeration of the skin, and would send off some trustful disciples in a galloping consumption, doubtless, if the winter were cold enough. As it is, pneumonia or bronchitis may be relied on to do the business for them. Another gets quoted all round against "the pernicious practice of muffling up the neck" in cold weather. All such sweeping generalizations need much qualification. As they stand, they are among the most dangerous things in the world. There is little danger in being warm; but there is sure death, sooner or later, in being cold. A little perspiration is not dangerous, with reasonable caution to avoid a chill in cooling, and to keep full warm while damp. There is far more harm in over-heated houses than in any possible excess of clothing. Nearly all the people we know would do better to dress warmer, let in more air, and burn less coal. There is much error inculcated and cherished with regard to the supposed hardening effect of exposure. No doubt there is such a thing; but there is in practice a vast deal more of undermining and destructive effect upon constitutions from exposure. It is not getting used to the cold, so much as the habit of breathing the frost-purified air, that invigorates the constitution. To secure the latter, without incurring discomfort from cold, is the ideal of regimen to be sought. Why is the painful sensation of cold given, but to serve as a thermometer to regulate our protection, as well as our exertion, against too low a temperature of the body? Nor should the protection be too much put upon exertion. Vigorous youth may well defy the cold by dint of powerful exercise, and gain vigor in so doing; but not a

step farther than consists with freedom from discomfort and fatigue. To get in any degree exhausted, chilled, or blue with cold, in the battle is to lose the battle. For persons past the prime of life, for very young children, or for those who are from any cause delicate, it is sheer folly to seek invigoration from cold air without sufficient clothing to secure perfect comfort with easy exercise. What people imagine to be "hardening" against cold, is often nothing but deadening of the protective sensibility of the skin. Where to put the clothing is also a question on which most persons, and especially most advisers, are much in want of light. There are certain parts where Nature has placed her thermometers of sensation expressly to regulate this business. Such are the neck, the wrists, the back, the knees and the feet—parts which are among the most neglected, while they should be the most scrupulously protected against the signal of discomfort. The neck and wrists expose great currents of the blood constantly to the temperature of the air, and thus open enormous leaks of our vital warmth if not carefully protected. This is not necessarily "muffling" in all cases; and yet in many cases muffling is requisite. Whether it is so or not, any one can tell for himself by watching the sensation-thermometers that are placed at those points. The back part of the neck and knees, or just above the knees, peculiarly expose the nervous system, and if not properly protected let in catarrhal affections, chills, nervous exhaustion, etc. Of the extremities it is not so necessary to instruct people, so much is continually preached about the supreme importance of keeping them warm; but if any amount of warning could break up the universal habit of disregarding their complaints of cold until from habit we hardly notice them at all, the trouble would be well bestowed. It may be added that the region of the stomach and chest sometimes needs special warmth to secure a complement of blood to the great organs and vital nerve centres thereabouts. This is plainly indicated whenever there is coolness exhibited here to the warm hand. It is nonsense and worse to seek to invigorate such spots by exposure. The principal caution to be regarded in the use of warmth is in the matter of changes. Both wisdom and watchfulness are necessary in our variable climate to avoid positive danger. But here, as ever, the warm side is the safer side. It is much easier to guard against any danger from perspiration in a soft "spell" or change than against a sudden onset of cold with inadequate clothing. Nor does the habit of warm clothing during the mild intervals of winter create any such susceptibility to cold when it comes as we feel when sudden cold breaks in upon summer. Rather the reverse, if anything. It is best to keep up ample protection through thick and thin till winter is over, only relieving its weight as far as may safely be done in the outer clothing, and reinforcing it there at the first warning of a fall in temperature; for which the signal service reports are worth watching, even if not always infallible.—*Sanitary Era.*

OLEOMARGARINE.

AN EARNEST PLEA FOR ITS MORE JUST AND LIBERAL RECOGNITION.

[Address of Prof. James F. Babcock before the Massachusetts Committee on Agriculture, January 24, 1889.]

Mr. Chairman:—The truth of the saying that "History repeats itself" is shown in the unreasoning hostility which oleomargarine has always encountered from certain interests. It has happened many times in history that the selfishness and ignorance of a particular class have induced them, regardless of the general welfare, to delay or obstruct the progress of what, in the end, has turned to be a beneficent and useful invention. We have not far to look for illustrations. In 1834, a convention of farmers and stable-keepers was held at Albany to protest against the further development of railroads. They declared as the opponents of Stephenson had done, that if railroads were allowed to obtain a foothold, turnpike roads would be deserted and grown up with grass; country inns would be ruined; the race of hostlers and coach-drivers would be wiped out; the value of horses greatly depreciated, if indeed, the breed did not become extinct. Frightful locomotives, emitting a breath more poisonous than the famous dragons of old, rushing and tearing through the country, would prevent cattle from grazing and hens from laying. The terrible smoke would darken the sun. Crops would cease to flourish. Sparks would set fire to barns and hay-stacks. In short, the pursuit of agriculture would be impossible. Land would be thrown out of cultivation; land-holders and farmers reduced to beggary. Cows would refuse to give milk. Sheep would starve. The poor rates would be increased in consequence of thousands of persons being thrown out of employment, and all, that a few manufacturers and shippers might enjoy a gigantic monopoly in railroad traffic. We have only to substitute oleomargarine for railroads in these false prophecies, and we have the arguments of the butter-makers to-day. In the sixteenth century many improvements were made in the art of dyeing. It was found that cloth could be colored, not only better but cheaper, with indigo brought from the East, than with the native dyes according to the older methods. But there were many farmers in France and Germany engaged in the cultivation of pastel, a plant then largely used in all the dye-houses of Europe. They got up a farmers' panic and developed a tremendous opposition to indigo. The enemies of indigo, like the enemies of oleomargarine, well knew how much prejudice attaches to a name, and so they declared indigo to be "a pernicious, deceitful, eating and corrosive substance." They called it the "devil's dye," just as oleo agitators now talk of "bull-butter," and "hog's blubber." They demanded legislation and they got it. An imperial edict was issued against indigo in 1634 on the ground that by its use, "the trade in pastel was lessened, dyed articles was injured, and money carried out of the country." In Nuremburg they made a law that every dyer should take an oath not to use indigo. Henry IV. of France, in 1609, ordered that the punishment of death should be inflicted upon all who used the "false and pernicious drug called indigo." I might multiply these illustrations of selfishness and ignorance. History is full of them, and the final result has in every instance been the same. Useful improvements have always made their way in spite of coercive measures; in spite of class interests; in spite of derisive names. Oleomargarine is no exception. Its production is founded on the immutable principles of science, and those who oppose it might as well make up their minds that it has come to stay. Let those who doubt it look back over the pages of history, reading the lessons of past experience, and they will learn how narrow and selfish their present position will appear to those who, in future years, read with surpise the story of their factious opposition to a beneficent movement, which being useful must inevitably become common. We do not want, nor will we have, if we can help it, any more legislation for classes or corporations. We want neither land, railroad or banking monopolies. The farmers will have to concede that there are other people and other interests than theirs. We do not want trusts to put up the price of flour or sugar, and we do not want legislation intended to bolster up the market for poor butter for the exclusive benefit of butter speculators. Oleomargarine, as now made, is a cleaner, and every way a more reliable product than much of the butter on the market. It has the same food-value as butter and is sold at half the price. The time has gone by in Massachusetts when a small majority of farmers will be allowed to say to the laboring classes, "You must eat our butter or nothing." I know that the disclaimer has been made of any desire to prohibit the honest sale of oleomargarine, but every proposition which has, year after year, been made to this committee looking to a still more stringent enforcement of the present law—recomendations made by officers charged with its execution—have been thrown out. The agricultural committees of past years have refused to make any suggestions unless these amounted to practical prohibition by making oleomargarine objectionable in appearence. Dr. Harrington the present Milk Inspector of the city of Boston, appeared before this committee and asked for precisely the same legislation as I had asked for, three years successively. The petitioners have always opposed any suggestions in addition to present requirements calculated to compel oleomargarine to be sold for exactly what it is, because they want to come here, year after year, and say, "The present law is not perfect and we want something else." That something else is prohibition. They know they cannot hope to get that, and so they endeavor to arrive at practically the same result by trying to make oleomargarine distasteful to its honest consumers by coloring it red or black, or requiring that it shall not be yellow as it always has been. A member of the committee said to me last year, "If we can't get what we want, we don't want anything." What is this oleomargarine in regard to which there is so much agitation? It is simply natural fats combined in such a way as to produce an agreeable and healthful food. Every one of it constituents, when in a separate form is used as food, and every constituent is recognized as healthful. When united these various fats form a compound containing every constituent found in butter. The only difference between oleomargarine and butter is due to a small percentage of flavoring substances, natural to butter, but present in less amount in oleo. Ninety per cent. of butter consists of bodies identical with oleomargarine. Oleomargarine lacks only five per cent. of the flavoring substances found in butter. The stearine of butter is identical with the stearine of other fats. The oleine of butter is identical with the oleine pressed from tallow. Oleomargarine is often spoken of derisively as grease. This is true. Oleomargarine is grease, but butter is the same thing. We may separate from butter a white solid stearine and a fluid oil which cannot be distinguished from the same bodies obtained from other fats. Oleomargarine is not, as it is often called, "imitation butter," it is artificial butter. It has the same relation to butter that manufactured fertilizers have to stable manure. This is no doubt an ideal fertilizer, but there is not a sufficient amount produced to restore the fertility of the thousands of acres of worn-out fields which the farmer cultivates. The science of chemistry steps in and finds out the composition of manures, determining what constituents are essential and their proportions. It then gathers together the various bodies which compose it and makes an artificial fertilizer. It finds in South Carolina the phosphate rock. It brings from the mines of Germany, compounds of potash. It takes the refuse of the gas-works, and from the offensive tarry products it obtains ammonia. These are combined in the same proportions as they exist in stable manure, and result in an artificial product having all the essential properties necessary to the food of plants. So with oleomargarine. The chemist has analyzed butter, and determined the proportions of the various bodies which compose it. He then takes these identical bodies from various natural sources and makes an artificial butter having all the essential properties of natural butter. The agriculturist accepts the truth of chemistry in everything else but in making of oleomargarine. The day will come when he will be forced to admit that chemistry can produce artificial butter.

(*To be continued.*)

Subterranean Streams.—It has been discovered that a large portion of Utah is underlaid with a body of water which may be reached by boring wells from one hundred to two hundred feet. The wells flow so liberally that one of them will water five or six acres thoroughly. The desert is literally "made to blossom as the rose."

NEW BOOKS.

"WHAT MUST I DO TO GET WELL? AND HOW CAN I KEEP SO?" 8 vo. New York, W. A. Kellogg.

Under the foregoing somewhat processional title, Elma Stuart, a literary woman of considerable celebrity in England, has put forth a rather remarkable and decidedly interesting book. It is a record of her personal experiences in the recovery of perfect health from a condition of seemingly hopeless invalidism. An ordinary book on that subject would probably be rather dull to everybody but the author. This, however, is by no means an ordinary book. The pæan which the ebullient enthusiasm of the writer prompts her to ceaselessly sing throughout the story of her convalescence lifts it above that level. But still more is it entitled to command the reader's sympathetic interest by reason of the serious importance of the knowledge it so forcefully and convincingly conveys. Elma Stuart's malady was rheumatic gout. She was a cripple, unable to walk. And eminent physicians assured her that by no possibility could she ever be any better. Of course she suffered horrible agonies, mental and physical. Dr. J. H. Salisbury, of New York, the originator of the so-called "hot-water treatment," visited London, and she was induced to experiment upon herself with his system. She records that, from almost the first day she began strict treatment, she was conscious of marked improvement in her condition, and that her progress toward perfect health was continuous until every vestige of her ailments had disappeared. And this was the happy result from rigidly confining herself to a diet of selected animal food and copiously drinking hot water at carefully prescribed times—nothing else. This brings us to what is, after all, the main interest in the book, its intelligent exposition of the "Salisbury treatment" and of the theory underlying it, and strongly inviting confidence in it as a radical means of cure for even the most serious chronic cases of various diseases. This is desirable, for, though pretty much everybody has heard that curative virtues are claimed for hot water, few really know anything about the requirements for its use medicinally. A fool craze prevailed about it a few years ago, and did infinitely more harm than good. Supposing that all that was necessary was to get the hot water into them, people swilled it just before their meals—which was bad, or immediately after—which was worse. Some tried it once or twice, and, not finding any immediate miraculous effect from it, denounced it as a humbug. Only a few conceived that any dietary restrictions were included in the treatment, and those few generally went to absurd extremes. One is often told by persons who profess to know all about it that under the Salisbury treatment a patient is not allowed to eat anything but *raw* meat, which is grossly absurd and untrue. Dr. Salisbury is a thorough chemist, and his high repute as a microscopist is recognized in Europe as well as in this country. He commenced the practice of medicine as long ago as 1850, and for thirty years past has been relying mainly upon the hot-water-and-animal-food treatment with surprisingly successful results in dealing with almost all forms of disease. It is, therefore, no "new-fangled thing" or "mere theory," but a thoroughly proved system, founded upon scientific knowledge and such clear reason as appeals strongly to every intelligent mind. Dr. Salisbury affirms that all diseases not caused by accidents, poisons or infections emanate from unhealthful alimentation. Healthful alimentation would consist in a diet of about one part vegetables, fats and fruits to about two parts of lean meat by bulk, not by weight. When vegetable matter and fats are partaken of in excess of that proportion, they are likely to induce fermentation and consequent flatulence in the digestive organs, the most fruitful cause of an infinite variety of the gravest physical disorders. If largely in excess they are certain to have such effect. From the fermentation of food arise gases that cause pressure upon certain vital organs, induce torpidity in them, and give rise to fatty infiltrations and deposits in organs and tissues. Maladies of the kidneys, liver, spleen, stomach, heart, lungs and nervous system are all directly traceable to imperfect and unhealthful alimentation. When such diseases have declared themselves, two things are essential to cure—prevention of continuance of that malefic fermentation by removal of the germs which cause it, and abstention from such food as it may be set up in. Nature, then, aided by proper nutrition, performs the cure. Persistent sluicing out of the stomach and bowels by hot water sweeps away the germs of fermentation; restriction of food to properly-cooked and easily-assimilated lean beef and mutton at once affords the needed nutriment, and excludes all material in which those germs might maintain themselves and propagate by renewals of fermentation. It is a very simple theory, and experience demonstrates its correctness. The water should be drank as hot as it can be comfortably taken, not gulped, but sipped slowly, four times each day, a pint at each time, and always at such times as will leave an hour and a half between drinking it and subsequently taking food. Two and a half hours should elapse after eating before again drinking the hot water. A good time schedule would be this: 6.30 A. M., water; 8.00 A. M., breakfast; 11.30 A. M., water; 1.00 P. M., dinner; 4.00 P. M., water; 6.00 P. M., supper; 9.00 P. M., water; 9.30 to 10.00 P. M., bed. The first pint (at 6.30 A. M.) should be drank in bed, the patient resting most of the time upon the left side. A wooden goblet or cup to drink the hot water from will be found more agreeable than any other. Luke-warm water will not serve, and will be unpleasant to take. "As hot as is comfortable" is the requirement. If the hot water seems mawkish and repellant, an infinitessimal pinch of salt will give taste enough to render it agreeable. The meat must be lean, juicy, muscle tissue, freed from veins, fat, gristle and "strings." Steaks and "French" chops are prescribed and must be broiled. Give the frying pan a long rest. It is a good way to reduce juicy "round" beef to a pulp by scraping or chopping and then cook it in a saucepan, with a little "stock" (if the stock basis has had no vegetable matter in it) or strong beef tea. While cooking it must be constantly stirred until its red color changes to grey (which will take about ten minutes), and then served immediately. The nutrition should be abundant. Even a delicate patient should get away with one-and-a-half or two pounds of meat per diem. Between meals a nutritious beef tea (made from meat and not from meat-flavored salt called "extract") may be partaken of. Bread and toast—for which the patient will almost certainly clamor—are positively forbidden in the strict "treatment." When the patient has so far recovered that digestion is good and the germs of fermentation have been thoroughly washed away, toast—a very little—is allowed. There is no objection to the whites of eggs. Some simple medicines, such as ether "pearls," laxatives, valerian, etc., may be given as palliatives of temporary conditions, but none for constitutional effect. A hard struggle to conquer the habits of the palate and stomach is inevitable at the outset of the treatment, and the patient is pretty certain to become weak and to lose a great deal of superfluous and unhealthy tissue. That goes to a certain point and then a reaction sets in, and day by day the current sweeps on stronger and stronger toward rejuvenation and health. The intelligent reader will comprehend that simple as this course of treatment is, it is not easy to follow, but requires determined and persistent adherence to purpose and it is slow. But it is sure—or at least as sure as anything short of omniscient omnipotence seems likely to be. Cases of chronic dyspepsia, rheumatic gout, asthma, neuralgia, rheumatism, diabetes, fibrous growths, locomotor ataxy, and even consumption and Bright's disease are positively cured by it, when all other treatments fail. The writer of this review is able to speak of one case, within his personal knowledge, in which the Salisbury treatment has effected what eminent allopathic physicians affirmed could not be done. A lady, of middle age, whose maladies had been diagnosed by doctors of unquestionably good standing as heart weakness and Bright's disease, was so far gone that the physician who last gave her a prescription said: "She cannot recover, will probably not live more than a few weeks, and I should not be at all surprised to hear of her dropping dead at any minute. Medicines have almost entirely lost their effect upon her, and the little they still have is all that keeps her alive." At that time she was greatly swollen by dropsy, breathed with difficulty, and was threatened with heart failure as an immediate consequence of even slight exertion. In that condition she essayed the Salisbury treatment. Eight weeks have elapsed. In that time she has not taken a drop of the medicines for specific effects, which were "all that kept her alive," but the desired effects have been attained infinitely better simply by the hot water. The dropsical swelling has already entirely disappeared, and her muscular tissues have returned to a normal and healthful condition. Her heart is stronger, her breathing easy, her kidneys seem to be no longer affected, and her whole being is suffused with a sense of vitality, rejuvenation and contentment to which she has been a stranger for years past until the new gospel of hot water was preached to her. She is not yet thoroughly well. It would be too much to expect that diseased conditions which were the growth of sixteen years should be swept entirely away in half as many weeks. But that a few months of the treatment will restore her to perfect health can hardly—in view of the progress already achieved—admit of question. This case is in the present writer's own family, subject to his constant observation, and he is therefore justly entitled to speak of it thus precisely and confidently. It will be a sad blow to that eminently respectable triumvirate, the doctor, the apothecary and the undertaker, when people resort to the hot-water kettle and the butcher for the cure of their ailments, but just in proportion as knowledge spreads that blow must fall.

J. H. C.

LONDON UNDERGROUND.

THE SUBSOIL HONEYCOMBED WITH TUNNELS AND PIPEWAYS.

Year by year the work carried on before the surface of our chief thoroughfares becomes more extended and more important. The Thames is being tunnelled for another railway, whilst it is in contemplation to delve beneath the very centre of the metropolis in order to provide an electrical railway to convey passengers from Bayswater to the Thames Street terminus of the Southwark underground line. There are probably very few amongst us who, as they walk Cheapside or Leadenhall Street, are aware of the existence beneath their feet of the passage of a working power of enormous magnitude, by means of which hundreds of machines, lifts, presses and other working appliances which aid the labor of man are worked during day and night—a power even greater than that of steam. Passers-by may have looked upon iron pipes of enormous thickness being fixed beneath the roadway in some of our principal thoroughfares, without the slightest idea of their purpose. There are many miles of these massive conduits conveying water power at high pressure for the service of manufacturers, warehousemen and others, in lieu of steam, and a most serviceable, economical and safe power it has proved itself to be. In some of the provincial towns compressed air is being employed for a similar purpose; but in Hull, Liverpool, Manchester and London hydraulic power is employed through pipes drawn from several common centres. The hydraulic mains in London are of cast-iron, varying in internal diameter from 7 inches to 2 inches, and are kept charged constantly at a pressure of 750 pounds per square inch by powerful engines located at Blackfriars and Westminster. The engines at the Blackfriars station can pump three million gallons per week, and those at Westminster two million gallons;

and the rapidly-increasing demand for power has necessitated the construction of a pumping station at Wapping, which will deliver four million gallons per week. The present supply to consumers amounts to about 3,750,000 gallons weekly. This is consumed by somewhat over a thousand machines, and there are at the present time 200 applicants for machines to be connected with the mains. This hydraulic supply has another use of considerable value beyond that of a motive power, namely, its capability of materially aiding in the extinction of fire. It has been found that a small jet of high-pressure water injected into a larger jet from the ordinary waterworks so intensifies the pressure of the latter in the delivery hose that a stream of great power can be obtained at the top of a high building without the aid of a fire engine, which is, undoubtedly, a very important consideration in the first outbreak of a fire before the arrival of engines on the spot. Captain Shaw has stated that a most interesting experiment in this connection was recently made. The water jet from an ordinary main rose a distance of 40 or 50 feet. High-pressure water was turned on by a 3/8-inch aperture, when the jet at once rose to a height of 90 or 100 feet. It is estimated that the losses in Manchester from fire since the introduction of high-pressure hydrants were reduced by six-sevenths. In Liverpool the loss was reduced to one-fourth of what it was previously. If the annual loss from fire in London amounts, as is calculated, to over £2,000,000, and if the saving effected by an efficient system of hydrants were only one-fourth or even one-tenth of the saving effected in the cities mentioned, it would amount to hundreds of thousands of pounds annually.

JAPANESE LACQUER.

WHAT IT IS, AND HOW MANUFACTURED.

(Paper read before the Washington Chemical Society by Romyn Hitchcock).

Japanese lacquer is the product of a tree (Rhus vernicifera) which grows throughout the main island of Japan. It attains a large size, and will live for forty years, but only comparatively young trees are valued for the production of lacquer. Having yielded for several years they are cut down, the lacquer extracted from their branches, and young trees take their places. The best lacquer comes from Yoshino, in Yamato. The lacquer exudes from horizontal cuts in the bark, in the form of a rather viscid emulsion, and may be collected from April to the end of October. In the spring it is more watery than in the latter months. It exudes slowly and is collected by means of a pointed spoon-like instrument, and transferred to a wooden receptacle or tube of bamboo. Several cuts are made in each tree, the last as high as a man can reach. Having thus prepared a dozen or more trees in rapid succession, the collector begins to collect the juice from the cuts in regular order, beginning with the one first cut. Having finished the collecting, he takes other groups of trees and after about four days he returns to the first, where, after removing the accumulated yield, he cuts again into the same trees, and repeats the same process fifteen or twenty times. Thus the work may go on for eighty to a hundred days. As the sap first exudes, it is a grayish-white, thick, or viscous fluid, which quickly turns yellow, and afterwards black, where it is in contact with the air. The sap thus collected ki-ursushi; urushi being the general name for lacquer. An inferior kind is obtained from the branches when the trees are cut down. The branches are soaked in water for several months, then taken up and slightly warmed, when a small quantity of sap exudes. This is seshime-urushi. The lacquer is strained through cotton cloth to free it from bits of wood and dirt, first being thoroughly stirred to break up lumps and make a uniform mixture. The product thus purified is known as seshime-urushi: but this name which has already been used to designate the lacquer from the branches has now a different meaning, and is applied to the cheaper kinds of raw lacquer, such as are used for the first coats in lacquering. These lacquers have usually lost some of their water by stirring in shallow receptacles exposed to the sun. They have undergone no further preparation. Many varities are prepared for special purposes, ranging in price from one or two to six or seven dollars per kilogram. These differ in quality and color. There is a famous black lacquer prepared by the addition of iron, which forms a chemical combination to be mentioned further on; while red, green, yellow and other colors are imparted by the addition of various pigments, as cinnabar for red, orpiment and indigo together for green, orpiment for yellow, etc. Certain lacquers have a small proportion of drying oil (perilla oil) added to them. The most important and abundant constituent of lacquer is urushic acid, which occurs in the form of minute spherules. The acid is obtained by evaporating the alcoholic solution to a syrupy liquid. The evaporation must be carried on over a water bath. If too much heat be applied, a tough, black, rubber-like substance is obtained, which only strong nitric acid would effect in the slightest degree. Although the drying, or rather the hardening properties of lacquer are doubtless due to the oxidation of urushic acid, the product extracted by alcohol possesses no drying qualities. This fact was first observed by Professor Rein, in 1874. More recently, Professor Korschelt and Yoshida have found that a peculiar albuminoid of lacquer effects the drying by a diastatic or fermentive action. The fact seems to be that the lacquer hardens only when the albuminous substance is present. If heated above 60 deg. C., or above the temperature at which albumen coagulates, the lacquer will not dry. Besides urushic acid and the albuminoid, raw lacquer contains a gum resembling gum arabic, which doubtless imparts some useful properties to the lacquer, and a volatile acid, to which Professor Rein ascribes the poisonous effects of lacquer. A portion of raw lacquer, about 16 pounds, is poured into a large circular wooden vessel, and vigorously stirred with a long-handled tool for five or six hours, while the heat of a small charcoal furnace is ingeniously thrown upon the surface to evaporate the water. During the stirring certain ingredients may be added from time to time. The roiro, the fine black lacquer already mentioned, is made by adding iron at this stage. In Tokio a soluble salt of iron is used, but the Osaka manufacturer objects to that, asserting that it injures the quality of the lacquer. The material used in Osaka is the fine iron dust collected from the grinding of knives. This is added in quantities of about a teacupful of powder mixed with water at a time, until the desired color is obtained. When the work is finished the lacquer is poured into a vessel to settle and is afterwards drawn off the sediment.

BEER.

WHAT IT IS AND SHOULD BE.—AN IDEAL AND A REALITY.

Life is sustained by food. Food maintains the heat of the body and repairs all waste of tissue. To do this satisfactorily it must contain constituents identical with the elements of which the body is made up. In an average adult human being weighing, say 150 pounds, these elements are divided as follows:

Water	92	lbs.
Albuminoids or protein	27	"
Fats and oils	$22\frac{6}{10}$	"
Carbo-hydrates	$0\frac{1}{10}$	"
Minerals (soda, potash, iron, lime, phosphorous, etc.)	$8\frac{4}{10}$	"
	150 lbs.	

The albuminoids are those compounds which contain nitrogen, and they are classed as muscle and nerve formers. They occur alike in the animal and vegetable worlds as fibrine in the meat, gluten in the cereals, the white of the egg, and the curd of milk. The carbo-hydrates are those substances which principally contain hydrogen and carbon, and which, after being transformed into fats by the natural process going on within the body, unite with the oxygen inhaled from the air to produce combustion and heat. Chief among them are starch, dextrine, glucose, maltose and sugar. The fats, oils and alcohols are also used in the body as fuel. The mineral matters build up and keep in repair the framework or bones. Very few articles of food contain in themselves the whole of these essential elements, and hence the necessity for a mixed diet. The only remarkable exceptions to this rule are wheat, barley, oats and corn, all of which are capable of sustaining life, and have consequently been adopted as food staples. Well made and unsophisticated beers should be entirely and solely composed of an infusion of malted cereal grains and hops, fermented by the aid of yeast. When so composed, they are now recognized by all scientists, not only as being wholesome beverage, but as highly nutritious, heat forming, and readily assimilable foods. Hence the paramount importance of obtaining a pure article and the urgency for suppressing all forms of adulteration. An example of what beers ought to be is afforded by the following results of an exhaustive chemical examination of a sample of beer:

LABORATORY OF ANALYTICAL AND INDUSTRIAL CHEMISTRY and of the National Brewers' Academy.
No. 24 Park Place.
NEW YORK, *January* 31, 1890.

CERTIFICATE OF ANALYSIS.

We have examined the sample of Pavonia Beer, bottled by Otis S. Neale, of Howard Street, Boston, Mass., submitted by the AMERICAN ANALYST, New York City, with the following results for every 100 parts by weight;

Alcohol	2.870
*Maltose	2.800
*Dextrine	2.600
Albuminoids	1.110
Lactic Acid	0.171
Acetic Acid	0.084
Glycerine, Succinic Acid, Hops extracts and oils	0.950
Ash, or mineral matters	0.205
Salicylic Acid	none.
Sulphurous Acid	"
Deleterious preservatives	"
Water	89.210
	100.
Total extract	7.921
Phosphoric acid in the ash	0.065

This is a perfectly pure beer.

* Marked thus are carbo-hydrates.

FRANCIS WYATT, Ph. D.
A. WEINGARTNER, Ph. D.

These figures speak for themselves and demonstrate that the whole of the requirements prescribed by chemical laws, are entirely complied with. The Pavonia beer is a singularly excellent example of good brewing, careful bottling in clean dry bottles, aging before delivery, and the appearance of the beer is bright, clear and sparkling, the aroma most fragrant and taste most agreeable. It may be added that those who use this beer may find sometimes when this beer is suddenly chilled or allowed to get too cold that it will lose some of its brilliancy, this effect is one of the best recommendations for the beer, as it shows that it contains more albuminoid than ordinary beer, and these owing to the change in specific gravity from lowering of temperature become flocculent. A visit to Mr. Neales establishment and observation of the care, methods and cleanliness will show at once why he offers a superior beer. Another thing, and this is very important, this careful bottling of a perfect beer, insures its keeping qualities, without using any preservatives which frequently injure an otherwise wholesome beer.

BRITISH MUSEUM.—The experiment of electric lighting at the British Museum was entirely successful, and the system will hereafter be used permanently in those parts of the museum in which it has been introduced, and will be extended throughout the whole institution.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

February.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, pork.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, geese.

FISH.—Bass, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish.

VEGETABLES.—Artichokes, beets, beans, cabbage, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, tomatoes, turnips.

FRUITS.—Apples, bananas, grapes and oranges.

PRACTICAL RECIPES.

VENISON PIE.—Cut a venison steak into small pieces and stew until tender, season highly, make a rich gravy with the water in which it is cooked, by adding a little onion seasonings, and a piece of butter rolled in browned flour; bake with top crust only.

TOMATO CATSUP.—Add to half a bushel tomatoes, one quart pure cider vinegar, one pound salt, quarter pound whole black pepper, two ounces cayenne pepper, quarter pound whole allspice, one ounce whole cloves, half pound mustard, six good sized onions, two pounds brown sugar, and a handful of peach leaves; boil alltogether for three hours, stirring often to prevent burning. When cool strain through a fine sieve and bottle for use. This is excellent.

BAKED APPLES.—Pare a dozen tart apples, take out the core and fill up with sugar and a small bit of butter on top of each, put them in a pan with half a pint of water, bake till tender, basting occasionally. Serve cold with cream.

TAPIOCA PUDDING.—Take half a cupful tapioca, soak in one quart of milk for ten minutes, let it simmer on back of stove slowly, stirring occasionally. When it begins to thicken set the saucepan in a pan of water. Beat up one egg and whip in, sweeten to taste, add a teaspoonful of vanilla, and a taste of salt. When the tapioca is soft pour it into a dish and set away to cool. When cool, beat up whites of three eggs (the yolks may be put into the pudding if desired) and heap them on top, sprinkle slightly with sugar; put in the oven for two or three minutes and serve.

FROZEN APPLE ISLAND.—Stew until tender a dozen fine apples which you have pared and sliced, when cold sweeten; beat up the whites of five eggs very stiff, add the apples a spoonful at a time, beating hard for an hour until the island is smooth and light. Pour into a freezer and freeze as you would cream.

BOSTON TEA CAKES.—One well-beaten egg, two tablespoonfuls sugar, one cupful sweet milk, two heaping cupfuls sifted flour, two teaspoonfuls Horsfords' baking powder, a little salt, one tablespoonful butter, melted. Bake in small tins.

CABBAGE SALAD.—Yolks of four eggs, half a tablespoonful of mustard, half a tablespoonful black pepper, half a tablespoonful sugar, half a tablespoonful salt; beat in a dish half a pint boiled vinegar, strain, and add while hot to other ingredients, set away to cool; chop up a part of a fresh cabbage fine, pour the dressing over it, serve. This will keep in cold weather for a long time.

CREAM SLAW.—Half a cup of sour cream or cream and milk, half a teaspoonful mustard, small half teaspoonful salt, a dash of pepper, half a teaspoonful sugar, beaten yolk of egg, one large tablespoonful of vinegar; beat altogether in a bowl; put a piece of butter, the size of a walnut, into a hot spider, stir the sauce quickly into it, stir rapidly until it bubbles, add the chopped cabbage, stir thoroughly; remove the spider from the fire, cover, and set in a warm place for a few minutes, warm your dish, pour the slaw in and serve.

CLAM STIFLE.—Fill a deep pan or dish with a layer of sliced potatoes, a layer of clams, a layer of sliced onions, a layer of sliced potatoes, and a few small slices of salt pork, season with pepper, a little water, cover it with plate or pan, and bake in moderate oven five hours, add a little water if it dries away too much.

MARTHA'S VINEYARD, Feb. 10. C.

FEMININE ENTERPRISE.

A WOMAN WHO GIVES DINNERS FOR A LIVING.

Among the many occupations invented by impecunious women, perhaps the most original is that of a Philadelphia woman of thirty, who had been for several years at the head of her father's luxurious establishment. She learned thoroughly the art of entertaining, and one day, when suddenly left a penniless orphan, she determined to make this knowledge of some practical use. She was not much of a musician, and she didn't have either the knack or the desire to teach what languages she knew. She couldn't write or paint, and, in fact, found it difficult to find within herself any knowledge sufficiently great to be worth money enough to support her. "If I only knew one thing thoroughly," she cried, "but the only thing I know how to do is to give dinner parties. I know that exactly and completely, but the question is not how to give dinners, but how to get them to give." Thinking the matter over in every light, an inspiration came to her. There were numbers of people who had the means but not the knowledge for giving dinners. Why couldn't she teach them? She told her idea to friends and they encouraged her by employing her on such occasions, thus relieving themselves of infinite care and worry. Her method was this: She went to the intending dinner-giver the day the invitations were issued, and discussed ways and means. On the day of the dinner she orders the flowers, favors and dinner cards, arranging them herself; gets the dinner table into proper condition, sees that all changes of plates and silver are ready, and, like a major-general, stands and gives her orders until dessert is served, upon which she draws a sigh of relief, puts on her gloves and quietly slips away. Her patronage increased when her friends found what clever and original ideas she had, and realized how completely she lifted all the care and responsibility from their shoulders. She made a business of getting all the latest ideas from florists, caterers and shopkeepers, and applied them at once while they were new. After she became interested in the work she began to develop all sorts of original inspirations, which were popular and effective. She also made a point of hunting up clever little verses and quotations for dinner cards, and wrote them out herself upon cards she procured from various artist friends who had dined sumptuously at her own table in bygone days, and who were willing to be obliging now. At present she has secured a clientele who keep her occupied all through the season, and she manages to live very comfortably on the proceeds of her work. Naturally, commissions on all the things she recommends come into her hands, and these added to her other earnings make a sum sufficient for her needs.

FLIGHT OF BIRDS.—A canvas-back duck flies at an habitual rate of 80 miles per hour, which is increased in emergency to 120. The mallard has a flight of 48 miles an hour; the black duck, pin-tail, widgeon, and wood-duck can not do much better. The blue-wing and green-wing teals can do 100 miles an hour, and take it easy. The red-head can fly all day at 90 miles per hour. The gadwell can do 90 miles. The flight of the wild goose is 100 miles per hour.

ANCIENT SCIENCE.

THE SCIENTIFIC KNOWLEDGE OF THE ANCIENT GREEKS AND ROMANS.

(*Continued from page* 28.)

Our word magnetism is derived from Magnesia, the name of a town of Lydia in Asia Minor. In the neighborhood of this place there was found a kind of stone, variously called Magnesian stone, Lydian stone, stone of Heracles, and Siderite, which was observed to have the power of attracting iron. This stone, our loadstone (or, more properly speaking, lodestone), was known to the Greeks as early as the fourth century before our era. According to Pliny, the Romans knew four other localities which furnished the mineral: Magnesia, in Thessaly (to which our English dictionaries erroneously refer as the place from which the name was derived), Ethiopia, Bœotia and the Troad. Plato observed that the armature of a magnet itself became magnetic; and Lucretius, in his great poem on Nature, speaking of the lodestone, says: "It often produces a chain of rings hanging down from it. Thus you may sometimes see five and more suspended in succession and tossing about in the light breeze, one always hanging down from the one above it and attached to its lower side, and each one in turn from the other experiencing the binding power of the stone, with such a continuous current the force flies through all." He explains the attraction by assuming the existence of an ethereal force which poured forth from the lodestone or magnet itself, and permeated the pores of the magnetized object. Plutarch appears to explain the phenomenon on the same principle. The magnetic power of the earth itself and the phenomena arising from it were, in spite of some wild theories to the contrary (it has even been claimed that the ancients were acquainted with the mariner's compass), completely unknown in that day. There were, however, stories of all kinds suggested by the power of the lodestone, the best known being that of the "magnetic mountain," which drew the iron nails from the planks of ships that came too near it, and caused them to fall to pieces. Ptolemy, the geographer, gave the exact latitude and longitude of this remarkable mountain, whose existence was firmly believed in. Still less did the ancients know of electricity. It was known from the time of Thales, who lived at the beginning of the sixth century B. C, that electron, when rubbed, had the property of attracting light objects. What is meant by electron in this connection is not certainly known; amber, a mixture of gold and silver, tourmaline, a certain enamel, and platinum are some of the conjectures of those who have discussed the question. However this may be, it was afterwards learned that amber was the best material for generating this kind of electricity. This attraction was personified by the imaginative Greeks. They spoke of a soul in the amber, as the Chinese physicist Kuo-pho did in his Poem in Praise of the Magnet. Plato's view was that the amber contained a flame-like essence, but gave it out only when the pores of its surface were opened by rubbing. This essence, when given out, had the same action as the magnet, but, by reason of its lightness and weakness, could attract only the lightest and driest substances. Pliny, too, speaks of a flame which pours out of amber. The connection of this frictional electricity with the external manifestations of atmospheric electricity, and with the shocks given by electric fishes (found in the Mediterranean and Red Seas), was never suspected by the ancients.

There can be no question that some of our chemical experiments may lay claim to a very high antiquity. According to Plutarch, whose etymology is approved by no less an authority than Alexander von Humboldt, the Greek word for chemistry, from which our own word comes, was derived from an Egyptian word, *kemi*, originally meaning *black*, which was later a designation of the whole land of the Nile; so that *chemistry* was synonymous with the *black art!* The first known

Greek chemist (more properly a metallurgist) was Theophrastus, who lived in the fourth century before Christ. In a book of his On Minerals he treats of the extraction of metals from the ore, and describes the various compounds which were formed in the process. Among these are white lead and verdigris, which he states to be earths, expressly distinguishing them from stones or minerals. Unfortunately this is the only work on chemistry written before the Christian era which has come down to us, although we know from references of Pliny that such books existed. Their loss is particularly to be regretted, because it is possible that they might have thrown some light on the subject of polychromy, by telling us what aid the Greeks derived from chemistry in the preparation of the colors with which they decorated their statues and temples, and ornamented their walls with paintings. The encaustic painting of the Greeks had been especially discussed. Cato the Censor, who has already been referred to in these papers as having a practical knowledge of an important principle of heat, expresses some remarkably sound views about the rusting or oxidizing of metals under the influence of the air, and upon the evaporation of water from springs to produce salt. The writers of the first century of our era bear witness to the chemical progress of earlier times. We find from their reviews of the past achievements, that various chemical preparations were used in medicine, especially in the composition of salves, and that alloys and amalgams of many kinds were familiar. He distinguishes the oxides of copper, lead, and zinc from one another. The only acids that appear to have been used are vinegar (acetic acid) and sulphuric acid; to the former was attributed a dissolving power far greater than it really possessed. In his passage of the Alps, Hannibal, for example, is said to have dissolved rocks which barred his progress by the agency of vinegar. The process of distillation was used by the ancients. Aristotle refers to this operation, which is clearly described by later writers, together with the retort and the rest of the apparatus. The progress in the knowledge of alloys is seen in the Roman coins of small denominations. These at first were made simply of copper, but from the time of Commodus they were composed of bronze, with a varying proportion of zinc. Soaps were known to the ancients, but were merely mechanical mixtures, not chemical. One of the supposed soaps found at Pompeii proved to be nothing but fuller's clay. Alchemy began in the first century of our era, and the atomic theories of the philosophers are said to have led to the attempt to change the baser metals to the nobler ones. Towards the end of the fifth century this pseudo-science became very popular, and there were numerous guilds of alchemists at that time. The prolific writer, Hermes Trismegistus, wrote a book called *Tabula Smaragdina*, professing to teach the art of making gold, which was translated at Nuremberg in 1541.

In the concluding paper of this series the remaining departments of science will be briefly considered.—Dr. J. C. Rolfe, in *Pop. Science News.*

NICKEL.

SOURCE OF ITS SUPPLY AND HOW IT IS HANDLED.

In the Copper Cliff Mine, near Sudbury Canada, it is said more nickel is being produced than the entire market of the world calls for at current prices. A little branch off the main line of the Canadian Pacific Railway, four miles in length, leads out to the mine, which opens into the face of a crag of the brown oxidized Laurentian, rock, characteristic of this region. The miners are now at work at a depth of about three hundred feet below the surface. As fast as the nickel and copper-bearing rock is hoisted out, it is broken up and piled upon long beds, or ricks, of pine wood to be calcined or roasted, for the purpose of driving out the sulphur which it contains. The roasting process is of the nature of lime-kilning or charcoal burning. Each great bed of ore requires from one to two months to roast. When roasted the rock goes to the principal smelter, a powerful blast furnace "jacketed"—in mining phrase—with running water, to enable it to sustain the great heat requisite to reduce the crude, obdurate mineral to fluidity. The dross of the molten mass is first allowed to flow off, and afterward the nearly pure nickel and copper, blended together in an alloy called the "matt," or "matte," is drawn off at the base of the furnace into the barrow pots and wheeled away, still liquid and fiery hot, to cool in the yard of the smelter. The mat contains about seventy per cent. of nickel, the remaining thirty per cent. being mainly copper. When cold, the conical-pot loaves of mat can easily be cracked in pieces by means of heavy hammers. The fragments are then packed in barrels and shipped to Swansea, in Wales, and to Germany, where the two constituent metals are separated and refined by secret processes, which are very jealously guarded by the manufacturers. So jealously is the secret kept that no one in America has yet been able to learn the process, although one young metallurgist spent three years in Swansea as a common laborer in the factories, in order to obtain it. At present there are produced daily at the Copper Cliff Mine about ninety pot loaves of mat, each weighing near 450 pounds, an output which yields an aggregate of more than 4,000 tons of nickel a year.

IDAHO AVALANCHES.—On Feb. 3, the town of Burke, Ida., in the Cœur d'Alene mining district, was nearly destroyed by disastrous avalanches. Half of the business houses are in ruins. Three men were killed, and the terror-stricken inhabitants fled, fearing a repetition of the disaster. The ill-fated town lies in a narrow gulch, through which Canon Creek pours its water into the South Fork of the Coeur d'Alene. It had about two hundred inhabitants. The next day another disastrous avalanche swept down upon a boarding-house connected with the Custer mine, about five miles from Burke. The boarding-house was full of miners, six of whom were killed. The others had a narrow escape, and a number were more or less injured.

IMPERIAL JEWELS.—The fortune left by the late Empress Augusta will exceed, it is thought, half a million pounds, of which half, together with all the jewels, goes to the Grand Duchess of Baden absolutely.

A NEW NOTION.—A London confectionery store gives to every purchaser of a shilling's worth a ticket entitling the purchaser to have one photograph of herself taken at an establishment up stairs.

NEW ARMAMENT.— The Garde du Corps of the German army has been equipped with new small-bore repeating rifles, and the whole German army is expected to have the new arm by April 1. It will be the first army so equipped.

ANCIENT REMAINS.—The Americans who are exploring in Mesopotamia have uncovered at Niffus, the old Nipur, the temple of Bel, and have found tablets with inscriptions of as early as 3750 B. C., with other articles of archæological value.

SPARKLING AND BRIGHT.—Swallows and butterflies made of jet, gold tinsel and beads fly across the skirts and bodices of some of the latest fashionable evening dresses of English ladies, and it is predicted that the new style will drive out flowers as a trimming.

GERMAN COLONISTS.—It is announced that the Russian Government is about to issue a decree prohibiting further German colonization in South Russia. The Germans have acquired millions of acres of rich agricultural land in that part of the country within a few years.

NEW TEA SUPPLY.—The first consignment of tea from Perak, a settlement in the Straits of the East Indies, has just reached the London market, and was sold readily at good prices. The outlook for the new field, which is in English hands, is said to be very promising.

ON DECK AGAIN—The scarcity of editorial and local in our wide-awake journal this week is owing to a delightful superabundance of pious church meetings during the very happy Christmas festivities. We are now sober, in mind and body and will have our sun-burnt ear open for business next week.—*Red Lodge, (Mont.,) Picket.*

SEVERE SNEEZING.—A relapse of the grippe in the case of an Indianapolis girl was attended with a spell of sneezing that lasted, with the exception of a short time she was under the influence of chloroform, for forty-eight hours. The sufferer, a few hours after the spell set in, became so weak that she would fall almost lifeless on the pillow after each paroxysm of sneezing. Her throat swelled terribly, and for a short time it was feared the operation of tracheotomy would have to be performed. After the sneezing ceased, the girl gained strength rapidly, and at last accounts she was well advanced towards recovery. The attending doctors declare the case without parallel.

LITTLE MEN.—The Akkas are described by Dr. Junker as the only voluntary nomads of the Central African regions. They construct their little cone-shaped grass huts in the shelter of the trees of the woods, and live in a district as long as the chase lasts. They prefer to abide among some tribes and avoid others. The rulers welcome them, and they, being practiced archers and cunning warriors, are employed in the invasions of the territories of neighboring tribes. They possess no industry, and buy even their arrow-heads in exchange for meat, the produce of the chase. They are timid and suspicious, and Dr. Junker only once saw about one hundred and fifty of them together. They cannot properly be described as dwarfs, but only as relatively very small men.

BUSINESS NOTES.

HORSFORD'S ACID PHOSPHATE

Makes delicious lemonade. A teaspoonful added to a glass of hot or cold water, and sweetened to the taste, will be found refreshing and invigorating. Of its medicinal qualities Dr. L. C. S. Turner, Colfax, Ia., says: "I am very much pleased with it in mental depression from gastric troubles;" and Dr. C. R. Drake, Belleville, Ill., says: "I have found it and it alone, to be capable of producing a sweet and natural sleep in cases of insomnia from overwork of the brain, which so often occurs in active professional and business men."

DIAMOND MINE.—The largest shaft in Africa has just been opened in the Kimberley diamond fields. It measures 23 feet 3 inches by 7 feet 9 inches, and is to be 1000 feet deep.

THE TOY TRADE.—English manufacturers are said to be making good headway in the attempt to compete with the Germans in toy manufacturing. The business amounts to $10,000,000 a year.

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CONTENTS.

IS CHEESE DIGESTIBLE?

It is a well established fact, with which every chemist, and probably every competent dairy manufacturer is conversant, that the indigestibility of cheese is wholly owing to the fact that the caseine it contains cannot be sufficiently broken up by the processes of digestion to allow the digestive fluids to assimilate it. It is also well known that the ordinary methods of cooking do not break up the caseine, and that only by boiling under heavy pressure can it be partially peptonized. Under these circumstances it is impossible to make cheese any more digestible by simply cooking it. By eating it with fatty food such as butter, and probably by cooking it with an admixture of butter, it would be more easily digested. This being the case we cannot but be surprised at the contrary views on the subject advocated by so respectable an authority as the *Family Doctor*, and quoted below. The old question of who shall decide when doctors disagree, will probably never be fully settled. The following is the extract referred to, and it is all the more misleading because of the source from which it proceeds. Our contemporary says: "Much difference of opinion has prevailed in regard to the value of cheese as food, but we are beginning to get at real facts with a better understanding of the relations of the digestive functions to food elements. Cheese has been lauded by many because of the great amount of nutritive food elements it contains, and people have been urged indiscriminately to eat it freely, some enthusiasts making the most extravagant claims for it as a health diet. But many people who have sought to follow this counsel find themselves speedily the victims of indigestion and dyspepsia. They would consider it little short of treason to charge their disordered digestion to the cheese, but the truth is the cheese is the most probable cause in any such case. Although, so far as its constituents are concerned, cheese is fairly entitled to its fame as a model food, yet in raw cheese these constituents are very difficult of solution by the digestive juices—that is, raw cheese is indigestible to a degree that makes it unavailable as food except to the strongest and healthiest stomachs and should not be eaten by any one who finds on trial that it gives his stomach the least discomfort. It is found, however, that cooking the cheese removes this difficulty and makes cheese easy of digestion, and as nutritious as tender meat, or more so. Various methods have been adopted for this purpose, from plain broiling, frying or toasting, to the most elaborate compound dishes. The main point is to get the cheese cooked so that the stomach can digest it."

STARVATION FOLLY

The self-starving crank is probably the most stupid of all the idiotic host of misusers of nature's bounties. The *National Druggist* in its issue of February 15, expresses some very sensible views respecting the utter uselessness, either to the world at large or to the individual concerned, of this fad of experimentsl abstinence from food. An English doctor, named Allenson, has recently attracted considerable attention by living for a month on a diet of cooked wheat meal and water. Our contemporary relates how the doctor, in a sort of manifesto to his fellow-vegetarians, tells how much weight and strength of grip he had gained; how his eye-sight had improved and brain cleared under a regimen which had cost him under two pence a day, and his statements are now being copied in the medical and secular press of the world as though they were something new and valuable. The fact is, they are neither the one nor the other. The American Indians, more especially the Creeks, Cherokees, and Choctaws, had long ago shown that a man could subsist for a considerable period, and travel fast distances, on a daily diet of a few ounces of parched corn meal and water *ad libitum*. Long before these, the accidental experiences of ship-wrecked sailors, or men lost in wildernesses, imprisoned in mines, etc., had proven the same thing. We have yet to learn, however, that these men were any wiser or happier, or that they attained any greater longevity by their abstemiousness, voluntary or enforced. The fact is, the problem of nutrition is not how little we can subsist upon, but how to get the greatest enjoyment consistemt with sound health and length of days out of the bill of fare which our purses enable us to provide. The gratification of the sense of taste, within proper limits, is as laudable an ambition as that of the acquisition of knowledge or any other of the admitted ends and aims of existence.

AMERICAN MEDICAL ASSOCIATION.

The forty-first annual meeting of the American Medical Association will be held in the city of Nashville, May 20th. In connection with the meeting of the association there will be held the usual exposition of pharmaceutic, surgical and sanitary products and appliances. This exposition is expected to be one of the largest and most interesting exhibits of the kind ever held. Intending exhibitors should address Dr. J. B. Lindsley, Chairman of the Sub-Committee on Exhibits, Nashville, Tenn., at once, as a large attendance is probable, and the local committee desires to exercise care and deliberation in assigning space and arranging the exposition so as to present everything in the most attractive and effective manner. Choice of space will be given in accordance with date of application. The following classes of applications will be entertained: 1. Medical books and stationery, charts and diagrams, busts, portraits, engravings, photographs, etc. 2. Hospital and ambulance plans and models. 3. Surgical instruments and supplies, general and special (gynæcic, obstetric, orthopedic, laryngeal, optic, ophthalmic, dental, etc.). 4. Microscopes, analysis outfits and electro-galvanic apparatus. 5. Pharmaceutical products. 6. Rubber goods applicable to medicine and surgery. 7. Invalid furniture. 8. Invalid foods. 9. Sanitary appliances, as ventilators, filters, water-closet basins, traps, and similar necessities, and disinfectants. Applications for space should state the character of their proposed exhibits, that they may be assigned to their respective groups.

A PIPING FOCUS.

A proposition mooted some weeks ago in the city papers for the building of a milk pipe line from a point in New York State to this city provoked a rather general smile, and the matter was treated as a joke. The projectors were, however, it seems, in sober earnest. A company with a capital of $500,000 has, it is announced, been formed at Middletown, N. Y., for the purpose of constructing such a line. The proposed method of forwarding the milk is in cylindrical tin cans surrounded and propelled by water, and the promoters of the scheme assert that the time of transportation for a distance of 100 miles will not exceed an hour, while the profit will be about one cent a gallon. If this sort of things goes on, we need not be surprised to find New York the converging point not only of oil, natural gas, and milk pipe lines, but of whiskey ducts from the blue grass regions, and beer ducts from Cincinnati, St. Louis, and Milwaukee. The pipe manufacturers may

well feel cheerful at the prospect before them as well as the consumers of the commodities named at the vision of steady supply and lower prices.

A POSTAL TELEGRAPH SYSTEM.

In the House of Representatives, on February 18th, Mr. Wade of Missouri, introduced a bill to establish a government postal telegraph system. The bill creates a bureau under the control of a fourth assistant postmaster-general. This officer shall cause to be constructed through the States and Territories a trunk line of postal telegraph, to reach and connect all cities and towns that now have telegraphic communication. Such postal telegraph shall be constructed and kept in repair under the direction of the Secretary of War, through the Corps of Engineers, and the Postmaster-General is authorized to employ all persons necessary to conduct the business of the proposed system. The rate for transmitting messages shall be: For 500 miles or less, 10 cents for twenty words; from 500 to 1,000 miles, 1 cent a word, and a corresponding increase for greater distances. Press dispatches are to be taken 1,000 miles or less at one-third cent per word, and greater distances at proportionate rates. Nothing in this act is to be construed to prohibit individuals or corporations from carrying on the business of operating telegraph lines.

PENNSYLVANIA PEDDLERS.

The peddler nuisance has received a crushing blow in Pennsylvania through a decision of the Supreme Court. There is an old law of the State which forbids the issuing of peddlers' licenses to any except those unable to gain a livelihood by reason of bodily infirmity. Another section of the law forbids any public huckstering in Philadelphia. The law has been a dead letter for years. Able-bodied peddlers swarm all over the State, and Philadelphia has been a bedlam with the combined noises of old rag and bottle men, knife grinders, fruit venders, kindlingwood sellers, etc. Some of the distracted citizens recently sought to apply the law to the peripatetic nuisances, but were fought by them in the courts, the latter carrying their case up to the Supreme Court, which has just declared the law constitutional.

Soft Coal Smoke Beneficial.—The belief that smoke from soft coal may have beneficial sanitary effects is gaining ground. It is claimed that sulphur in the coal when burned becomes highly disinfectant. Further that creosote and its allied products are thrown off with the fumes of bituminous coal, and that an atmosphere charged with carbonic acid must be freer from germs of disease than an apparently purer air.

OLEOMARGARINE.

AN EARNEST PLEA FOR ITS MORE JUST AND LIBERAL RECOGNITION.

[Address of Prof. James F. Babcock before the Massachusetts Committee on Agriculture, January 24, 1889.]

(*Continued from page* 87.)

Food Value of Oleomargarine.—For all purposes as a food; for keeping up the natural warmth of the body; for giving strength to the arm and power to the muscle, there is little difference between eleomargarine and butter. If there is any difference, it is in favor of oleomargarine. When the laborer sits down to his daily meal, he and his children find the same nutriment, the same strength-sustaining quality, the same power of warmth in oleo that they do in butter, and they are able to obtain it for half the money. This is oleomargarine—made under government inspection. No unclean or unhealthful ingredient possible in its composition; the government stamp a guarantee of its purity. Made by no secret process; protected by no patents; the factories everywhere open to public inspection, and the healthfulness of the product certified by every leading authority in the world

Let me read you what has been said of oleomargarine by some of the most noted scientific men in the United States: Prof. C. F. Chandler, professor of Chemistry at Columbia College, N. Y., says: I have studied the question of its use as food, in comparison with the ordinary butter made from cream, and have satisfied myself that it is quite as valuable as the butter from the cow. The product is palatable and wholesome, and I regard it as a most valuable article of food. Prof. George F. Barker, of the University of Pennsylvania, says: Butterine is, in my opinion, quite as valuable as a nutritive agent as butter itself. It is perfectly wholesome, and is desirable as an article of food. I can see no reason why butterine should not be an entirely satisfactory equivalent for ordinary butter, whether considered from the physological or commercial standpoint. Prof. Henry Morton, of the Stevens Institute of Technology, New Jersey, says: I am able to say with confidence that it contains nothing whatever which is injurious as an article of diet, but on the contrary, is essentially identical with the best fresh butter and is superior to much of the butter made from cream alone which is found in the market. The conditions of its manufacture involve a degree of cleanliness and consequent purity in the product, such as are by no means necessarily or generally attained in the ordinary making of butter from cream. Prof. S. W. Johnson, Director of the Connecticut Agricultural Experiment Station, and Professor of Agricultural Chemistry in Yale College, New Haven, says: It is a product that is entirely attractive and wholesome as food, and one that is for all ordinary and culinary purposes the full equivalent of good butter made from cream. I regard the manufacture of oleomargarine as a legitimate and beneficent industry. Prof. S. Cadwell, of Cornell University, Ithaca, N. Y., says: While not equal to fine butter in respect to flavor, it nevertheless contains all the essential ingredients of butter, and since it contains a smaller proportion of volatile fats than is found in genuine butter, it is, in my opinion, less liable to become rancid. It cannot enter into competition with fine butter; but so far as it may serve to drive poor butter out of the market, its manufacture will be a public benefit. Prof. C. A. Goessmann, of Amherst Agricultural College, says: Oleomargarine butter compares in general appearance and in taste very favorably with the average quality of the better kinds of dairy butter in our markets. In its composition it resembles that of ordinary dairy butter, and in its keeping quality, under corresponding circumstances, I believe it will surpass the former; for it contains a smaller percentage of those constituents which, in the main, cause the well-known rancid taste and odor of a stored butter. Prof. Charles P. Williams, Professor in the Missouri State University, says: It is a pure and wholesome article of food, and in this respect, as well as in respect to its chemical composition, fully the equivalent of the best quality of dairy butter. Prof. J. W. S. Arnold, Professor of Physiology in the University of New York, says: I consider that each and every article employed in the manufacture of oleomargarine butter is perfectly pure and wholesome; that oleomargarine butter differs in no essential manner from butter made fr m cream. In fact, oleomargarine butter possesses the advantage over natural butter of not decomposing so readily, as it contains fewer volatile fats. In my opinion, oleomargarine is to be considered a great discovery, a blessing for the poor, and in every way a perfectly pure, wholesome, and palatable article of food. Prof. W. O. Atwater, Director of the United States Government Agricultural Experiment Station at Washington, says: It contains essentially the same ingredients as natural butter from cow's milk. It is perfectly wholesome and healthy, and has a high nutritious value. Prof. Henry E. Alvord, formerly of the Massachusetts Agricultural College and President of the Maryland College of Agriculture, and one of the best butter makers in the country, says: The great bulk of butterine and its kindred products is as wholesome, cleaner and in many respects, better than the low grades of butter of which so much reaches the market.

Such is oleomargarine—healthful, nutritious, fully equal to butter in food value and sold at half the price. It would seem that an invention of this character, which tends to diminish the cost of living and lessen the burdens of the toiler, was entitled to the encouragement of the State and nation. But no. The dairy interests, guided by selfish impulses, have everywhere invoked the power of national and State governments to crush out this new food product, hoping thereby to prevent competition, and to raise the price of butter.

Influenced by the clamor of butter speculators, and especially those who handled the lowest grade of butter by the wholesale lying of a few so-called agricultural newspapers, and by a sort of farmers' panic skilfully worked up by those who had personal ends to serve, certain congressmen, setting policy and votes above conscience, passed an infamous tax bill, the avowed purpose of which was to crowd oleomargarine to the wall. They are willing to allow a man to sell poisonous whiskey under a retail tax of $25, but a dealer in pure and healthful oleomargarine must pay twice as much. A man can manufacture pure rum or "Jersey lightning," by paying a tax of $100, but the manufacturer of cheap food must pay $600. Manufacturers and dealers in a wholesome food product, cheaper and better than much of the butter commonly sold, are compelled to pay a tax from two to five times as great as that levied upon an occupation that is crowding our prisons, and supplying candidates for the gallows. Butter men seated around this room advocated and promoted this disgraceful legislation. They compelled every housekeeper whose circumstances influenced him to prefer oleomargarine to butter, to pay a tax equivalent to three cents per pound upon every particle of it which he consumed. They were disappointed that they did not make the tax ten cents per pound. Farmers talk of excessive taxation, but caring nothing for millions of laborers in other fields whose hardships are ten-fold greater, they were willing to impose this burden, because they believed that thereby butter would sell at an increased price of five cents per pound. This is the ultimate object aimed at in the legislation on this subject which is asked of this committee. Well, Mr. Chairman, the butter merchants and the dairymen got their bill—this revenue-tax bill intended to kill oleo. They said it was all they wanted. Even the fiery *Homestead* in an editorial paragraph (July, 1886), asserted that the "bill made suitable and reasonable provision to compel the sale of oleomargarine in its true guise and upon its own merits. The law," it said, "will drive out impostors, protect producers of pure butter from the enemy that competes only by fraud and deceit, and will guarantee customers of the charac-

ter and quality of the product." And in another place it said: "The bill is so carefully drawn that the dishonest can hardly hope to evade it."

The bill became a law in July and was to take effect in November. Butter makers greatly increased their production, and butter speculators laid away large stocks in anticipation of a rise. But they were deceived as to the truth of the situation and the crash came. The price of butter at Elgin during the winter of 1886-87 averaged 25 per cent. less than it had before the passage of the oleomargarine bill. The exaggerated reports about the production of oleomargarine and its effect upon the butter market had misled hundreds of butter makers and butter dealers, and in the losses which they sustained in the winter of '86 and '87 they reaped the results of the falsehoods told by those whose selfish leadership they had blindly followed. Contrary to the hopes and expectations of its enemies, oleomargarine did not die. It had a merit which neither abuse, misrepresentation nor unjust legislation could kill. The revenue tax law designed and intended to crush the new industry, notwithstanding its oppressive taxes, proved a boomerang of the heaviest sort, and instead of injuring oleomargarine, it has under the efficient administration of the Revenue Department, in many respects been of substantial benefit to manufacturers, dealers and consumers. As a recent writer has said: "When a dealer offers to his trade rancid, sour or cheesy butter, it is now impossible for his customer to accuse this stuff of being oleomargarine. The buyer knows that the vigilance and care of the officers of the government protect him from buying oleomargarine without the proper brand upon it. In such case the blame goes directly where it belongs, namely to the slovenly butter maker." The *Dairy World*, an agricultural journal of wide circulation and influence last year published an article as follows: "This law was designed to entirely prohibit the manufacture and sale of oleomargarine, and as a prohibitory enactment has proved a signal failure. Why? We think it is because oleomargarine possesses considerable merit and that the investigation before Congress brought its better qualities prominently before the public. This legislative agitation has educated the people, and the Government stamp has proved to be an official certificate of its healthfulness and not a badge of dishonor." The United States statute has now been in full operation for more than three years, and according to its strict requirements, oleomargarine has been sold under its true name. Ladle-packed butter, its chief competitor, has in the meantime continued to profit by the dishonest brands of "dairy" and "creamery" which are almost universally put upon it, yet the results of this competition have been such that the friends of oleo are quite content to abide the issue of that universal law which provides for the survival of the fittest. The dealers in low grades of butter, who have always been at the bottom of all this agitation, have got down to their last ditch. For years they have waged a desperate and uncompromising warfare against a product which the public is fast discovering to be more desirable than theirs. They and their allies until within a short time have, by every possible misrepresentation sought to prejudice the public against oleomargarine on the ground of healthfulness. One gentleman, a Boston butter dealer, who has always been in the front rank of the opposition to oleo, said to a committee of the United States Senate, that "every conceivable grease of the very filthiest kind in our country is manufactured into imitation butter and sold to customers." He said, also, that it was a principal cause of Bright's disease. [Testimony of S. P. Hibbard, 49th Congress, Sen. Miss. Docs., No. 131, p. 30–31.] I remember the speech of another gentleman in the Massachusetts Senate—a few years since. This gentleman said that oleomargarine "contained the germs of cancer." Others have called it "nasty and unwholesome;" "a compound freighted with disease;" "producing insanity;" "the product of the charnel house;" "the slag of the butcher shop;" "a compound of diseased hogs and dead dogs." These are some of the delicate expressions which these gentlemem have applied to a product which the Massachusetts State Board of Health in response to a special inquiry of the Massachusetts Senate, declared to be "a good healthful article of food, and much better than the poorer grades of natural butter." The loathsome lying of the cheap butter dealers has come to naught and they long ago acknowledged their defeat on the health issue and abandoned their guns. They come here to-day and admit the healthfulness of oleomargarine, and they thereby admit the falsity of what they said in this very room, only a year or two ago.

(To be continued.)

BEE SCIENCE.

BILL NYE DESCRIBES SOME OF HIS PRACTICAL INVESTIGATIONS.

I love to study bees, and once kept bees myself. I often think of what a late writer has said "that within so small a body should be contained an apparatus for converting the various sweets which it collects into one kind of nourishment for itself, another for the common brood, glue for its carpentry, wax for its cells, poison for its enemies, honey for its master, with a proboscis as long as its body itself, microscopic in several parts, telescopic in its mode of action, with a sting so exceedingly sharp that were it magnified by the same glass which makes a needle's point seem a a quarter of an inch across, it would yet itself be invisible, and this, too, a hollow tube—that all these varied operations and contrivances should be included within half an inch of length and two grains of matter is surely enough to crush all thoughts of atheism and materialism." The queen, during the propagating season, lays as high as two thousand eggs in a day, and I have given much thought to the grafting of the queen bee upon the Plymouth Rock hen, with a view to better egg facilities, but so far meet with but little success. My experiments have been somewhat delayed by the loss of time in taking the swelling out of myself after each perusal of the bee character in his or her home life. A writer says the best way to ascertain the location of the queen is to divide the swarm, after which it will be noticed that the one having the queen will quietly settle down again, while the other portion will become very restless indeed. I tried this myself, and noticed that they were restless. They also communicated their restlessness to me. All of us got restless. The drones are the male bees of the hive. They do no work except to act in a parental capacity and vote. They have no stinger, but in its place they have a good appetite and a baritone voice. They are destroyed by the workers soon after the honey season, and the widows have it all their own way. About nine-tenths of the hive are workers, or females, say twelve to fifteen thousand. These are the busy bees referred to in books. They get up early in the morning, eat a hasty meal, and go out looking for honey. They fly with great force, and as straight as a bullet. Sometimes they try to go through a man on their way to the hive, but only get part way.

COAL.

STEADY EXHAUSTION OF THE MINERAL SUPPLIES OF THE EARTH.

When we turn to the work of civilized races, we see that the exhaustion of the earth's stores of minerals is going on very rapidly. It is not merely that the absolute quantity of the earth's mineral wealth used up yearly by civilized races is large; but that the proportion of this annual consumption to the entire store is extravagant, in view of the length of time over which the store ought to last, unless the future of our race is to be much briefer than we have any reason to expect. Let us take man's use of the earth's buried stores of coal and oil as illustrations of the process of exhaustion. It has been estimated that beneath the earth's crust there lie about 8,000,000,000,000 cubic yards of coal at depths rendering them available for the use of man; in round numbers, this would be a little over 7,000,000,000,000 tons of coal. Of this store Great Britain has, available for use, about a fiftieth part, or, more exactly, according to the best estimates, 145,000 millions of tons. This is an exceptionally large supply for an area so small. Yet Great Britain, which has not yet reached either the fulness of its growth or the full development of its civilization, consumes already each year more than 150 millions of tons of coal, a rate of consumption which would fully exhaust her store in a little over 900 years—a mere second compared with the duration of man on the earth in the past. Thus a people which may be regarded as typical of modern civilization, supplied by nature with a hundred times more wealth in coal than the area of their country would entitle them to expect, are spending their share of this form of buried wealth (really buried life) at such a rate that the exhaustion of the region they occupy will be completed in less than a thousandth part of even that period (a million years) which science regards as the time unit by which the earth's future is to be measured. It is not likely that any other region of the earth will remain much longer stored with coal than Great Britain. Elsewhere there are immense supplies, and as yet, where these large supplies exist, the human race is not so closely crowded as it is in Great Britain; but wherever the earth is thus well stored, the population is growing in density, and at rates showing that in less than two centuries the population per square mile will be greater than in England. So far as coal is concerned, the outlook is that the earth's buried stores will be entirely exhausted in less than 2,000 years. If we remember that the consumption of coal is an index of the rate at which other mineral stores are being exhausted, that coal is not merely being used in the direct work of civilization, but in procuring the materials by which that work is continued, we cannot fail to see that other portions of the earth's stored wealth must be undergoing a process of rapid exhaustion. As a matter of fact, all other forms of stored wealth are being exhausted at spendthrift rates; many are being exhausted far more rapidly even than coal, and some are being exhausted so rapidly that their future duration may be counted by years rather than by centuries.—*Journal of Man.*

Women Dentists.—There are four women dentists in New York. One of them who graduated in Philadelphia two or three years ago, has a large clientage.

An Old Malady.—"Do you know that the influenza is mentioned in the Bible?" asked the snake editor.

"No," replied the horse editor.

"Yes; in Paul's time the Jews had Agrip-pa."

German Remedy.—The celebrated German remedy for burns consists of fifteen ounces of the best white glue broken into small pieces in two pints of water and allowed to become soft; then dissolve it by means of a water bath, and add two ounces of glycerine and six drams of carbolic acid; continue the heat until thoroughly dissolved. On cooling this hardens to an elastic mass covered with a shining, parchment-like skin, and may be kept for any length of time. When required for use it is placed for a few minutes in a water bath until sufficiently liquid and applied by means of a broad brush. It forms in about two minutes a shining, smooth, flexible and nearly transparent skin.

Toads and the Electric Light.—A lady tells how she was recently waiting in a carriage near an electric lamp which had just been lighted, while her friend went to a neighboring shop. In the dry road she presently saw a stir, and, looking over the wheels, saw, hopping in all directions across and around, toads aiming for the light. She got out and aimed for the lamp, too! There was a ring of toads underneath it already, waiting for the fall of moths and the insects of night that drop from the life-destroying flame. It was a curious sight—those creatures squatted in a circle, with upturned heads, waiting for the victims to drop into their mouths.

COCOAS.

SOME ANALYSES SHOWING THE RELIABILITY OF ADVERTISED STATEMENTS.

In the issue of February 13th, the AMERICAN ANALYST promised its readers an analyses of some of the much advertised cocoas in the market, and to-day we redeem our promise. Four packages of cocoa made by different manufacturers were purchased in the open market and removed fom the package bearing the labels, were simply marked by numbers, and with the directions we herewith reproduce were handed to Messrs. Wyatt & Weingaertner, who make the accompanying report thereon. This report speaks for itself. We need only add in further explanation that the amount of cocoa butter extracted from the cocoa is a matter of taste, judgment and experience with the manufacturer, that of course the fat is less digestible and therefore an excess is not desirable. The non-fatty cocoa insoluble in cold water is the nutritious and really valuable part of the cocoa. The amount of mineral matter present is an undesirable feature. It may also be added that samples 1 and 3 are really not any more soluble than No. 2, and that in our opinion the addition of alkaline salts has been made to solve the cellulose of the shells which have been added for adulterating purposes and that alkaline additions do not make pure cocoa more soluble. No. 2 is the cocoa manufactured by the old and well-known firm of Walter Baker & Co., of Dorchester, Mass.

OFFICE OF THE AMERICAN ANALYST,
No. 19 Park Place,
NEW YORK, *February* 4, 1890.

DRS. WYATT & WEINGAERTNER.

Dear Sirs—Herewith please find four samples of cocoa, marked numbers 1, 2, 3, and 4. Please inform us

First—Do either of these contain any added soda, potash, or magnesia?

Second—What percentage of fat do these samples contain?

Third—What is the amount of added starch in each?

Fourth—Do either of these contain any shells?

Truly yours,

"THE AMERICAN ANALYST."

LABORATORY OF INDUSTRIAL CHEMISTRY,
24 Park Place,
NEW YORK, *February* 13, 1890.

To the Editors AMERICAN ANALYST:

In accordance with your request of the 4th inst., we have made a careful examination of the four samples of cocoa sent to us and find as follows:

	No. 1.	No. 2.	No. 3.	No. 4.
Moisture	4.30	3.80	4.60	4.27
Added starch	none	none	none	none
Added sugar	none	none	none	none
Fat	30.00	21.00	28.00	36.00
Non-fatty cocoa soluble in cold water	20.60	20.00	19.00	15.00
Non-fatty cocoa insoluble in cold water	37.10	50.40	42.40	39.83
Mineral matter in the soluble cocoa	5.40	3.80	5.60	4.60
Mineral matter in the insoluble cocoa	2.60	1.00	0.40	0.30
	100.	100.	100.	100.

All these cocoas have been deprived of certain proportions of their fat. Numbers 1 and 3 are mixtures of cocoa-nibs and shells, and as shown by the abnormal percentage of mineral matter have both been adulterated by the addition of considerable quantities of alkaline salts. Numbers 2 and 4 are perfectly pure cocoas.

Respectfully yours,

WYATT & WEINGAERTNER.

DINNERS AND DINERS.

ELEGANT REPORTS OF ANCIENT AND MODERN SOCIETY.

There is more sound sense than respect for antiquity in the recent suggestion of a writer in the *Tribune* that it is about time to put Lucullus on the shelf. For more than 1800 years the world has been talking rubbish about Lucullean feasts. Imagine an American at a Lucullean feast! Why, Lucullus, with all his treasury notes, was a heathen so far as feasting was concerned. There is no doubt that he ate himself to death. Some years before he died he sank into a state of mental feebleness and imbecility, which obliged him to surrender the management of his affairs to his brother Marcus. It was not the quantity of the food he ate, but its quality, that put so miserable an end to him. Such food would destroy the digestion of an ostrich. What did the Romans know of the culinary art anyway that one of their old generals should be held up to the world as an example for all time? Fielding proved many years ago that there was a large amount of fudge about Lucullus, so it is quite unnecessary for the writer to ransack the encyclopædias for further information on that point. Circumstantial evidence is not needed to convict the old man. On general principles, he was, from a culinary point of view, a fraud. True, the "Roman Xerxes," as Pompey derisively called him, was generous in the entertainment of his friends. A single supper which he gave some of them is said to have cost him 50,000 denarii, or about $8,500. Delmonico, or Pinard, or Sherry, or the Cafe Savarin, could get up a tolerably respectable dinner on $8,500, but Lucullus probably sat his guests down to a feast of barbecued sow, topped off with cherries. Lucullus was excessively vain of his cherries, and as for his sow she was always served high. At rare intervals, on state occasions, he treated his great friends to a thrush on toast. Titus Flamininus gives us an excellent view of a Roman supper. "I supped once," said he, "with a friend, and could not forbear expostulating with him at the number of dishes he had provided, and said I wondered where he had furnished himself with such a variety. 'Sir,' replied he, 'to confess the truth, it is all hog's flesh differently cooked.'" The hog played an important part in Roman civilization. And it had its influence on religion, too, in another corner of the world. Buddha died of an overfeed of dried boar's flesh. In recent times there has been more hog at the table than on it. Perhaps the best livers were the old French noblemen of the Middle Ages. The modern world has never seen such luxuries and extravagances as attended the Banquet of the Pheasant, given by Philip the Good, Duke of Burgundy, when he was striving to organize a crusade against the Turks. That was the most gorgeous dinner recorded in history. Alessandro Filippini, who has become well known through his book, "The Table," says that New York contains a larger number of so-called high livers than any other city. Filippini ought to be a judge of high living, as he has been with the Delmonicos for a quarter of a century. Many of the finest dinners given in this city since the war were prepared by him, though of late he has confined himself closely to his restaurant duties. "The finest dinner with which I ever had anything to do," he informed the writer, "was the dinner given by the citizens of New York to President Andrew Johnson in honor of his visit to the city in 1866. The cost was about $100 a plate." Such a statement would seem to imply that there has been a falling off in the quality of dinners in the last twenty-four years. Not so, however. The dinner to President Johnson was an extraordinary affair—one in a lifetime—and extraordinary pains were taken to make it historical. New York gives twenty dinners now where it gave one then. As any man can eat a good dinner and but few can order one, the writer asked Filippini: "When a dinner is ordered, is the arrangement of the menu left entirely with you?" "That is generally the case," he answered. "So few men have the time for arranging it. Many, however, could do it, I have no doubt. New Yorkers dine so well and so often that they are educating themselves rapidly in almost every branch of the culinary art. As a rule, when a dinner is ordered, I inquire how much the expenditure is to be for each plate, and arrange my menu according to that. Of course I mean a public dinner. That is the most satisfactory way of treating them. In preparing dinners I was always very particular about the arrangement of the tables. That is a most important matter, and it not infrequently makes or mars the success of an entertainment." As everybody is interested in setting a table three times a day, Filippini's method of doing it is worth the space required to explain it. "To set a table," says he, "seems, perhaps, very easy, but to set it properly and tastily is not such an easy matter. Place the table in the centre of the dining-room, under the chandelier, and see to it that it is perfectly steady; that is to say, that there is no danger of its being shaken while the dinner is in progress. Should it not rest firmly, perhaps an old relic, in the shape of a Bland dollar, could be made serviceable by placing it under one of the feet. See to it that there is plenty of space between the covers; it is annoying to come in contact with every move of your neighbor. A table for six persons should be six feet long. Take a woolen cloth and put it over the table, and then place a linen cloth on top of it. This will deaden the noise of plates and glasses. Flowers should never be absent from the table when you have guests. They can be procured at all seasons. A large basket or bouquet should be placed in the centre of the table; a large bouquet on the right side of the cover for each lady, and a small boutonnaire for each gentleman, also on the right side. On enter a dining-room the first object that strikes the eye is the table. If it is devoid of flowers and other side decorations, including olives, radishes and celery, tastefully-arranged napkins and wine glasses, an impression is given of a boarding-house table. On the contrary, when you see a beautifully decorated and artistically-arranged table, the heart is immediately gladdened. On each side of the centre-piece place a fruit-stand, nicely arranged with the choicest fruits of the season. Next to this place a 'compotier' with assorted cakes. Place celery, olives, celery or radishes symmetrically in the space that is left between the centre-piece and the covers. Fish knives, soup spoons and oyster forks must be placed on the right side of the plate, and the fork on the left side. On the right side of each cover place seven glasses, a green glass for sauterne, a glass for sherry, a red glass for Rhine wine, a glass for champagne, a glass for Latour, a glass for Chambertin, and a glass for water. The decanters containing sherry and sauterne should be placed in the spaces between the centre-piece and the head and foot of the table. Napkins can be arranged in various styles and figures; into flowers, or any other desired form. The latest and most fashionable way is to arrange them folded plainly, so as to show the monogram of the family. A small salt-cellar should be placed at the left of each cover, to avoid asking the servant for it. Menus, either written or printed, should be placed at each cover. It is not a breach of etiquette to refuse a course you do not desire; by knowing what is coming you can with propriety refuse a course and take the next one. About ten minutes before beginning dinner fill the decanters with sherry and sauterne. Care should be taken to have the wines at the right temperature. Sherry, sauterne, Chablis and Rhine wine should always be served cold. Champagne should be served very cold, almost at the freezing point. Bordeaux and Burgundy should be kept twelve hours before dinner in a room at a temperature of 70 degrees. Servants should be instructed to fill the glasses not more than three-fourths full; for guests are in danger of soiling their dresses, and, again, it is not considered good form to fill them to the brim. Always serve plates on the right side and remove on the left." "Would you follow the same method in setting a table for 100 covers or 1,000?" the writer inquired. "The arrangement would be practically the

same, governed by the size and shape of the table. On a large table there would be space enough for 'pieces montees.'" There has been considerable talk among New York diners-out concerning Senator Stanford's dinner to Mrs. Grant. It is believed that the eighteen guests ate from plates of gold and silver; that under each wine glass there was a napkin of point duchesse lace; that the table-cloth was bordered with point duchesse lace; that the finger-bowls rested on point duchesse lace, and that the terrapin was served in individual silver tureens. Washington dinners were never finer than they are now, though the wife of Associate Justice Miller cannot recall anything more elaborate and luxurious than the dinner given by Chief-Justice Chase twenty-seven years ago. The entertainments of Vice-President and Mrs. Morton are the envy of the national capital.

PROVERBS AND SCIENCE.

SCIENTIFIC VERIFICATION OF SOME OLD TIME POPULAR CONCEITS.

There is much true wisdom and scientific observation embodied in many popular beliefs and sayings, even when the logical connections between the premises and the conclusions are not at first sight evident. For instance, it was believed for many years that the presence of barberry bushes in the neighborhood of a wheat field had an unfavorable effect upon the crop. This was always considered an agricultural superstition until it was found that, in one stage of its existence, a fungus very destructive to wheat takes up its lodgment on the barberry bush, forming the curious growth known as the "cluster cups." Sayings in regard to the weather are very abundant, and although in many cases, such as the alleged influence of the moon, they have no basis in fact; in others they are really dependent upon well-known meteorological laws. Many of the "weather proverbs" have descended to us from our English ancestors, and are not applicable to the climatic conditions of the western world. Among these are the dread of east winds, which in England are cold, dry winds, blowing from the large areas of land lying to the east, forming the countries of Russia and Siberia, while with us the east wind is a moist sea breeze, and rarely or never has a temperature much below the freezing point. A very reliable sign of stormy weather is when the sun rises clear and shortly goes into a cloud. This indicates the presence of rapidly condensing moisture in the atmosphere, which is likely to soon fall as rain. A lurid color of the sky at sunrise, halos around the sun and moon, "a rainbow in the morning," and the "sun drawing water," are due to the same cause, and are all omens of stormy weather. The belief that if "it clears off in the night" the fair weather will not continue, has, apparently, no basis in fact, and as far as our observations go is by no means correct. Fair weather seems to be as likely to come at one period of the twenty-four hours as another. Sailors say that if a storm clears with the wind "backing round" to the north, another storm will immediately follow. This can be probably explained by the fact that when the centre of a cyclone or rotary storm passes over any point there is a temporary calm, after which the wind commences to blow from the opposite direction. This sign, however, like many others, is by no means infallible. When the water in the tea kettle boils away rapidly a storm is said to be near at hand. It is true that the low atmospheric pressure preceding a storm would slightly lower the boiling point of water, but we do not believe that the effect would be appreciable. It seems more likely that in this case the common belief is founded more upon theoretical than practical considerations. The saying that "a green Christmas makes a fat churchyard" is a popular recognition of the unhealthfulness of a warm, open winter. Unseasonable weather of any sort has an unfavorable effect upon the system, and the ennervating effect of a high temperature in winter, when the usual cold, bracing weather is to be expected, is very marked. On Candlemas day (February 2d) the wood chuck is said to come out of his hole and look around to see if his body casts a shadow. If it does, he goes back for a longer sleep; but if the sky is clouded he knows that winter is over, and does not return to his former quarters. We are afraid that in New England the woodchuck must very often consider himself a victim of misplaced confidence, but the belief may have arisen from certain weather observations, showing that clear and cold weather about that date was likely to continue, and that storm and rain indicated a more or less early breaking up of winter. As to the January thaw, the Indian summer, the equinoctial storm, and the dog days, they have no existence whatever as definite meteorological phenomena. One might as well speak of the January snow storm, as to consider any particular period of mild weather in that month a special and regular occurrence. These periods of hot, cold, or stormy weather may occur at any time within their appropriate seasons, but do not recur in successive years with any regularity whatever, and they can only be foretold on the principle of the old-fashioned almanacs, whose prediction of "a storm may be expected about this time, extended over an entire month." As to the influence of the changes of the moon, the spots on the sun, the markings of the breast bone of a goose, and many other similar signs and wonders, upon the changes of the weather or other terrestrial phenomena, they must be considered as superstitions, pure and simple, without any basis whatever, either in scientific theory or actual fact. It is remarkable how much faith ordinarily intelligent people will place on these signs, which every day experience shows to be utterly unreliable, and it can only be accounted for by the fact that the failures are quickly forgotten, while the occasional coincidences are carefully remembered and handed down to succeeding generations. The natural forces and laws governing the weather are entirely irregular in their action, and there is no possible way in which the state of the weather can be predicted for more than forty-eight hours in advance, and even for that length of time the conspicuous failures of the government "indications" show how little is really known about the matter and how suddenly the conditions governing meteorological phenomena may change the manner of their manifestation.—*Pop. Science News.*

BEER.

WHAT IT IS AND SHOULD BE.—AN IDEAL AND A REALITY.

Life is sustained by food. Food maintains the heat of the body and repairs all waste of tissue. To do this satisfactorily it must contain constituents identical with the elements of which the body is made up. In an average adult human being weighing, say 150 pounds, these elements are divided as follows:

Water	92	lbs.
Albuminoids or protein	27	"
Fats and oils	$22\frac{5}{10}$	"
Carbo-hydrates	$0\frac{1}{10}$	"
Minerals (soda, potash, iron, lime. phosphorous, etc.)	$8\frac{4}{10}$	"
	150 lbs.	

The albuminoids are those compounds which contain nitrogen, and they are classed as muscle and nerve formers. They occur alike in the animal and vegetable worlds as fibrine in the meat, gluten in the cereals, the white of the egg, and the curd of milk. The carbo-hydrates are those substances which principally contain hydrogen and carbon, and which, after being transformed into fats by the natural process going on within the body, unite with the oxygen inhaled from the air to produce combustion and heat. Chief among them are starch, dextrine, glucose, maltose and sugar. The fats, oils and alcohols are also used in the body as fuel. The mineral matters build up and keep in repair the framework or bones. Very few articles of food contain in themselves the whole of these essential elements, and hence the necessity for a mixed diet. The only remarkable exceptions to this rule are wheat, barley, oats and corn, all of which are capable of sustaining life, and have consequently been adopted as food staples. Well made and unsophisticated beers should be entirely and solely composed of an infusion of malted cereal grains and hops, fermented by the aid of yeast. When so composed, they are now recognized by all scientists, not only as being wholesome beverage, but as highly nutritious, heat forming, and readily assimilable foods. Hence the paramount importance of obtaining a pure article and the urgency for suppressing all forms of adulteration. An example of what beers ought to be is afforded by the following results of an exhaustive chemical examination of a sample of beer:

LABORATORY OF ANALYTICAL AND INDUSTRIAL CHEMISTRY and of the National Brewers' Academy.
No. 24 Park Place.
NEW YORK, *January* 31, 1890.

CERTIFICATE OF ANALYSIS.

We have examined the sample of Pavonia Beer, bottled by Otis S. Neale, of Howard Street, Boston, Mass., submitted by the AMERICAN ANALYST, New York City, with the following results for every 100 parts by weight:

Alcohol	2.870
*Maltose	2.800
*Dextrine	2.600
Albuminoids	1.110
Lactic Acid	0.171
Acetic Acid	0.084
Glycerine, Succinic Acid, Hops extracts and oils	0.950
Ash, or mineral matters	0.205
Salicylic Acid	none.
Sulphurous Acid	"
Deleterious preservatives	"
Water	89.210
	100.
Total extract	7.921
Phosphoric acid in the ash	0.065

This is a perfectly pure beer.

* Marked thus are carbo-hydrates.

FRANCIS WYATT, Ph. D.
A. WEINGARTNER, Ph. D.

These figures speak for themselves and demonstrate that the whole of the requirements prescribed by chemical laws, are entirely complied with. The Pavonia beer is a singularly excellent example of good brewing, careful bottling in clean dry bottles, aging before delivery, and the appearance of the beer is bright, clear and sparkling, the aroma most fragrant and taste most agreeable. It may be added that those who use this beer may find sometimes when this beer is suddenly chilled or allowed to get too cold that it will lose some of its brilliancy, this effect is one of the best recommendations for the beer, as it shows that it contains more albuminoid than ordinary beer, and these owing to the change in specific gravity from lowering of temperature become flocculent. A visit to Mr. Neales establishment and observation of the care, methods and cleanliness will show at once why he offers a superior beer. Another thing, and this is very important, this careful bottling of a perfect beer, insures its keeping qualities, without using any preservatives which frequently injure an otherwise wholesome beer.

COOLING OF THE BODY BY SPRAY.—Some interesting laboratory experiments have been made on the effect of spraying a considerable part of the body surface of animals with cold water. So successful were these that the spray has now been applied for the purpose of reducing febrile temperature in human beings. In the case of a man suffering from phthisis, whose temperature was high, it was found that by spraying about a pint of water at between 60 and 70 degs., Fahrenheit, over his body, the temperature fell to normal, and continued so for several hours. A similar method was satisfactorily adopted in the case of a girl with diphtheria. In the healthy human subject the spray lowered the temperature nearly 2 degs.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

February.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, pork.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, geese.

FISH.—Bass, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish.

VEGETABLES.—Artichokes, beets, beans, cabbage, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, tomatoes, turnips.

FRUITS.—Apples, bananas, grapes and oranges.

PRACTICAL RECIPES.

FRUIT CAKE.—Two cupfuls butter, four cupfuls sugar, mix well; add two cups of milk, mix thoroughly; add beaten yolks of eight eggs, mix well; add eight cupfuls flour; beat to a stiff froth the whites of the eggs, and add to batter with another cup of flour, in which two good teaspoonfuls Horsford's baking powder is mixed. Prepare a small cup of currants, one cupful raisins, one-half cup citron, mix a little flour with them, add to cake; bake slowly for an hour.

LIVER WITH ONIONS AND BACON.—Put about half a tablespoon of sweet drippings or lard in a hot frying pan; cut into small pieces a large onion; slice your liver very thin and put it into the boiling grease; let it brown well, turn it, put the onion on top of the pieces, sprinkle well with flour, and over all plentifully sprinkle salt and pepper; cover with a pan and let it cook until quite brown; mix the onion and flour into it with a knife when brown, and let it fry until the onions are done; pour a cupful of hot water into the pan, cover, and set it on the back of the stove; fry on another pan a few pieces of bacon; when brown add to the liver and dish.

WHIPPED PRUNES.—Wash and soak two cupfuls of prunes; boil them in plenty of water until very soft; mash them through a colander, return them to the saucepan, add one-half cup sugar; cook again until it is melted; pour into a dish to cool; when nearly ready to use beat with a fork the whites of two eggs very stiff; whip lightly but thoroughly into the prunes and serve.

BRAIN OYSTERS.—Pour boiling water over the brains; cut them into four parts and skin them; cut them into pieces the size of oysters, roll them in flour, fry them in a little fat as you would oysters; sprinkle with pepper and salt; pour over them a little melted butter and serve at once.

APPLE FLOAT.—Peel as many apples as will make a pint when cooked, and stew them until tender in as little water as possible; wash them through a sieve, sweeten; flavor slightly with a few drops of lemon and set away to get very cold; when ready to serve whip the whites of two eggs very stiff, and add them lightly to the apples.

CORN BATTER BREAD.—Sift together six teaspoonfuls of flour and three of corn meal, with a little salt; whip up four eggs and add to the flour, with enough milk to make a thin batter; bake in small pans in a quick oven.

MEAT LOAF.—Take any cold meat and chop it fine, lean and fat together; add a finely-chopped onion, two slices of bread which have been soaked in milk, salt and pepper, and one beaten egg; mix well; press it into a buttered mold and bake.

TIMBALES.

HOW TO PREPARE ONE OF THE MOST DELIGHTFUL OF ENTREES.

One of the most delicious of the many dishes which French chefs serve in perfection is the timbale. This may be a sweet dish, but is usually an entree—a ragout served in paste. It may be a large dish, but it is not the large timbale which is treated here, but the "petite timbales" which are cooked in little dariole molds or tin cups with straight sides the size of wine glasses. Many chefs use a simple paste, such as is used for pies; small macaroni or spaghetti is also used; but the most delicious timbales of all are those made with a paste of the raw breast of chickens, with bread, and the white of eggs and cream. An excellent recipe for this elaborate preparation may be found in Miss Parloa's "Kitchen Companion." A simple rule is to line little dariole molds, with fine, short, pie-crust, cut into squares a raw piece of fillet of veal weighing about a pound and a half; pound it to a paste, add five or six chicken livers, if you have them, if not, two large ones will do nicely. Fry the livers in a little butter, add them to the veal, and pound the whole till it is a well-mixed paste; add three tablespoonfuls rich gravy. Rub the veal paste through a sieve, add a quarter of a pound of ham cut in dice, season the mixture with salt, pepper and a few drops of onion juice; add a little rich sauce—only enough to prevent the mixture becoming dry. Fill the buttered timbale molds and let them bake twenty-five minutes. At the end of this time remove them from the oven, turn them out on a platter, and serve them with a nice brown mushroom sauce. The recipe is excellent with macaroni substituted for the paste. Select long strips of macaroni (do not break them); boil them in water for ten minutes to soften them; begin at the bottom of the timbale molds and line them with the macaroni, curving it around to fit the bottom and sides. As soon as the timbale molds are lined with the macaroni, mask it with a little of the veal mixture mixed with the white of a raw egg; then fill the timbales with the mixture. Truffles and bits of tongue cut in ornamental pieces, are frequently used to decorate timbales. These little dainty entrees are as often served without a sauce on a napkin as in any way.

PLEURISY.

Pleurisy, or pleuritis, is an inflammation of the pleura or serous membrane investing the lungs and lining the interior of the thoracic cavity. It is a common form of chest complaint, and may be either acute or chronic, more frequently the former. The morbid changes which the pleura undergoes when inflamed are similar to those which take place in other serous membranes, such as the peritoneum, and consist of three chief conditions or stages of progress. (1) Inflammatory congestion and infiltration of the pleura, which may spread to the tissues of the lung. (2) Exudation of lymph on the pleural surfaces. This lymph is a variable consistence, sometimes composed of thin and easily separated pelicles, or of extensive thick masses or strata, or again showing itself in the form of a tough membrane. It is of a grayish yellow color and microscopically consists mainly of coagulated fibrine along with epithelial cells and red and white blood corpuscles. Its presence causes roughening of the two pleural surfaces which, slightly separated in health, may now be brought into contact by bands of lymph extending between them. These bands may break up or may become organized by the development of new blood vessels, and adhering permanently, may obliterate throughout a greater or less space the pleural sac, and interfere to some extent with the free play of the lungs. (3) Effusion of fluid into the pleural cavity. This fluid may vary in its characters. Most commonly it is clear or slightly turbid, of yellowish green color, sero-fibrinous, and containing flocculi of lymph. When large in quantity it may fill to distention the pleural sac, bulging out the thoracic wall externally, and compress more or less completely the lung, which may in such cases have all its air displaced and be reduced to a mere fraction of its natural bulk lying squeezed up upon its own root. Other organs, such as the heart and liver, may in consequence of the presence of the fluid be shifted away from their normal position. In favorable cases the fluid is absorbed more or less completely and the pleural surface again may unite by adhesion; or, all traces of inflammatory products having disappeared the pleura may be restored to its normal condition. Pleurisy frequently arises from exposure to cold, hence it is more common in the colder weather; but besides this various other causes are connected with this occurrence. The symptoms of pleurisy vary; being generally vell-marked but sometimes obscure. In the case of dry pleuresy, which is on the whole the milder form, the chief symptom is a sharp pain in the side, felt especially in breathing. Fever may or may not be present. There is a slight dry cough; the breathing is quicker than natural, and is shallow and of catching character. If much pain is present the body leans somewhat to the affected side, to relax the tension on the intercostal muscles and their covering, which are even tender to the touch. Pleuresy with effusion is usually more severe than dry pleurisy, and although it may in some cases develop insidiously it is in general ushered insharply by rigors and fever, like other acute inflammatory diseases. Pains felt in the side or breast, of a severe cutting character, referred usually to the neighborhood of the nipple, but it may be also at some distance from the affected part, such as through the middle of the body or in the abdominal or iliac regions. This transference of the pain occasionally misleads the medical examiner. The pain is greatest at the outset, and tends to abate as the effusion takes place. A dry cough is almost always present, which is particularly distressing, owing to the increased pain the effort excites. The breathing is painful and difficult, tending to become shorter and shallower as the disease advances, and the lung on the affected side becomes compressed. The patient at first lies most easily on the sound side, but as the effusion increases he finds his most comfortable position on his back or on the affected side. When there is very copious effusion and, as is apt to happen, great congestion of the other lung, or disease, affecting it, the patient's breathing may be so embarrassed that he cannot lie down. Pleurisy may exist in a latent form, the patient going about for weeks with a large accumulation of fluid in his thorax, the ordinary acute symptoms never having been present in any marked degree. Cases of this sort are often protracted and their results unsatisfactory as regards complete recovery. The chief dangers in pleurisy are the occurrence of a large and rapid effusion, particularly if both sides be affected, causing much embarrassment to the breathing and tendency to collapse, the formation of an empyæmia (often marked by recurring rigors and hectic symptoms); severe collateral congestion of the other lung; imperfect recovery, and the supervention of phthisis. Further the consequences are apt to be more serious where pleurisy exists as a complication of some pre-existing complaint.

This disease requires prompt and skillfull treatment; but, like pneumonia, described in a previous number, it is nearly always the consequence of exposure or severe cold. In the beginning, this is amenable to certain remedies, and there is none better than Dr. J. C. Ayer's Cherry Pectoral, made by J. C. Ayer & Co., Lowell, Mass. This well-known preparation has been the means of preventing innumerable cases of pleuritis from becoming more extensive and dangerous. It is a standard medicine, approved by leading physicians, and unequalled either as an anodyne or expectorant.

ACTIVITY IN SHIPBUILDING.—There are abundant evidences that America is destined to forge her way to the front in the shipbuilding industry. There has been unwonted activity in this department during the past year, and it is worthy of note that steel shipbuilding is now in active progress in California, owing to the federal government having placed contracts for new steam

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CONTENTS.

WHO IS RESPONSIBLE?

At a recent meeting the Boston Retail Grocers' Association after discussing the widespread adulteration of food articles, appointed a committee to ask for the enactment of a law whereby the names of adulterated articles shall be published in prominent dailies and one of the trade papers of the State. One of the speakers referred to the report of the State Board of Health, which showed that out of 4,900 samples of spices and articles of food, 30 per cent. were found to be adulterated. The Portland Evening *Express*, in commenting upon the subject, says: "This is all very well, but the retail and wholesale grocers have it in their own power to put an end to this pernicious practice, as far as they themselves are concerned at least. Let the members of the association make an agreement that they will neither buy nor sell an article of food that they know to be impure and adulterated. Let them resolve that not a single article to be found in the list that they propose to have published shall be sold by them, and they will accomplish practically far more than they can hope to by legislative enactment. The remedy lies in their own hands. Why not apply it?" To which the Boston *Grocers' Gazette* responds, that while such an agreement by the association would be a very good thing, it requires legislation to make it of any value. There is not a grocer in the business who can tell adulteration in food articles, except in very few cases, without analysis. Then, when adulteration is discovered, publication should be made compulsory by law in the daily and trade papers, since the reports of the State Board of Health do not reach the trade to any extent. Many honest and reputable wholesale and retail grocers today, are innocently selling adulterated goods believing them to be pure. It is impossible, continues the *Gazette*, "to detect adulteration, which is reduced today to a science, without analysis. But analysis is of no value without widespread publication of the names of the adulterated goods, the manufacturers, the place of manufacture, the kind and per cent. of adulterants. Given such a list, under a mandatory statute, and the retail grocers can agree to avoid such goods to some purpose. The agitation of the subject, we are glad to say, is becoming general; and we shall hail with delight the day when goods of dishonest, dishonorable and unprincipled manufacturers will find no demand in this State, or, if sold, shall bear upon their labels the same warning which the Jewish law compelled the loathsome lepers to cry out in the neighborhood of the uncontaminated, 'unclean! unclean!'"

WHAT'S IN A NAME?

The various designations given in various countries to the epidemic that has created such havoc during the past few months have been compiled by the *Medical and Surgical Reporter*. Considering that the disease has, as yet, been by no means satisfactorily classified, it is rather amusing to glance over the remarkable names which it has been given. Coming originally from St. Petersburg, it started out, on its tour of the world, as "the Russian Influenza" or "Russian Catarrh." Its sudden onset caused the profession in France to designate it as "la grippe," and "fievre catarrhale epidemique;" the German journals call it "Grippe," "Blitzkatarrh" or "Die Russische Krankheit." The medical journals of Italy have no uniform name for it, but speak of it principally as the influenza or "catarro Russo." The Spanish call it "influencia Rusa;" the Swedish, "Ryska snufvan" and "nyssjuka." In Norway and Denmark it has been given the name of "nysesyge." In England it has been called "bronchopneumonia" and "infectious bronchitis," also "contagious catarrh." In Cuba it is spoken of as "la componte." In the United States the name "Harrison Grip" has been offered, in remembrance of the "Tyler Grip" of 1841, and it has also been termed "epidemic febrile catarrh." In Europe some have called it dengue fever; others, not wishing to commit themselves, have given it the compound title of "Grippe or Dengue," leaving the preference to the reader's choice. Perhaps its most original name is that given to the disease by a noted English physician, who has called it "bastard pulmonary rheumatism." The variety of names proposed indicates the differences of opinion entertained in regard to the nature of this curious and serious disorder. As a matter of fact, the disease appears so unlike any which has yet been fully described in the books as to deserve a special name. It is not influenza and it is not dengue, though it has at times symptoms like those of one or other of these disorders. For the present the term "Grippe" seems the best, because it does not imply identity of nature with any other disease, and leaves the field open for a more exact and accurate designation whenever the nature of the disorder may be better understood.

HARNESSING NIAGARA.

Judging from the newspaper reports it would appear that there is at last a perfected plan, backed by money already subscribed, to utilize the power of Niagara—not of Niagara Falls, but of the waterhead of the river above the falls. A company has been organized which expects to speedily begin the digging and blasting necessary for the building of its main tunnel, which will be about two and one-half miles long. The system by which the force of the river is to be used is familiar to all who have had occasion to interest themselves in the scheme. The ground above Niagara where the factories of the company are to stand has already been bought by the company. The estimate of cost for tunnel, twenty-four cross tunnels, twelve raceways and bulkheads, and necessary masonry, timber, walls, etc., is $2,250,000. It is thought to be practicable by the men who are undertaking to convey this power as far as Buffalo (twenty miles) for lighting that city with electricity, and new ways of using and conveying the inexhaustible force of Niagara River it is thought will be discovered in the future. One of the best-known banking houses in Wall street is said to be deeply interested in this undertaking.

CHECKING THE SPOILER.

The notorious extortions and impositions of the metropolitan Jehu seem likely to be brought to an end through the aid of an ingenious mechanical device. The idea originated in Paris, where recently seven cabs were furnished with seven different and rival methods of ascertaining the length of ten different fares. The systems will be on probation for a month and at the end of that time one will be selected for universal adoption. They vary very little in design; what has to be ascertained being which system will work with greatest accuracy and at the lowest cost. As you enter the vehicle a dial faces you which registers your liabilities. The very act of entering sets free an electric current and the dial announces that you already owe half a franc for taking the cab. Then when you start on your journey the dial shows every kilometer you go, with a charge of 25 cents for each. The rotations of the wheel supply the means of

ascertaining the distance, which is, of course, the same whether the speed is great or little. At any moment the hirer can tell exactly how many miles he has gone and his exact fare, and the cabman, who is thus paid by mileage with a fixed entrance, finds his own interest in driving fast and getting as many jobs as possible.

OLEOMARGARINE.

AN EARNEST PLEA FOR ITS MORE JUST AND LIBERAL RECOGNITION.

[Address of Prof. James F. Babcock before the Massachusetts Committee on Agriculture, January 24, 1889.]

(*Concluded from page* 98.)

As I have said, the revenue-tax law so far as the prohibitory results intended by its framers are concerned, has proved a dead failure, and so, again drawn from their intrenchments, the enemies of oleo have fallen back determined to make one last effort, and have rallied under the painted yellow flag of colored butter. They claim a trade-mark in Nature's yellow—a pre-empted right to so-called butter color. This is the issue to-day. This claim, like so many others which the butter-makers have rashly made, has no foundation. The usual color of edible oils and fats is yellow, as yellow as any butter. Centuries ago the tables of the patrician Roman were served with golden yellow oil of the olive, while butter, not then used as food, was employed only for certain medical uses, and principally for greasing the bodies of athletes previous to their wrestling contests in the arena of the Coliseum. The fat of beeves, enriched by the same fodder as that given to milch cows, is yellow. The rich oil which rises on the broth of chicken or boiled fowl has a deeper color than ordinary butter. Cotton-seed oil, so largely used in the South for food, and by us for salads, has a brilliant yellow color; and oleomargarine prepared from cotton-seed oil or peanut oil and beef suet in the summer time, is as yellow, if not yellower than is ordinary winter butter. Shall it be said that the manufacturer of oleomargarine has not the right to the natural color of his own product? But it is said that the oleo maker adds color to his product, making it thereby yellower than it is naturally. This is true, but has he not the same right to do so as the dairyman? and especially in view of the fact that the dairyman's cottonseed oil color, as he now uses it, was invented by the oleo maker. The first man to dissolve annatto in cotton-seed oil for a butter color was the oleomargarine manufacturer, while the dairyman never used oil color in his butter, until after he had been shown how to do it by his competitor. The butter-maker whose poorly-fed cows gave white butter, used carrots, and safflower, and he had employed various alkaline solutions of annatto which colored the butter-milk, but he never knew that the best color was an annatto-cottonseed-oil color until he had learned it from the maker of oleomargarine. And now the butter-makers claim the exclusive right to appropriate this invention.

Colored for the same Reasons as Butter.—It is said that the oleo maker colors his butter in order to deceive. I deny it, and assert that he colors his goods for exactly the same reasons as the butter maker, and that there is no reason for coloring applicable in one case, which is not equally applicable in the other. Why is butter colored? The reply usually given is: "To please the eye, and make the product of different churnings uniform in color and appearance." Assuming this to be true, and waiving the question of deception, if there be one, involved in butter coloring; the concealment of poor quality; making dry-feed winter butter appear like a grass-fed June product—waiving these matters and assuming the reasons given for coloring butter to be correct—has not the oleo maker the right to make his goods attractive in appearance? Has he not the right to make his product—the product of different days and of varying materials, of a uniform color? Has not the poor man and the man in moderate circumstances the same right to have his oleo made "pleasing to the eye" as the millionaire, whose æsthetic tastes are offended unless his winter butter has the color of "Jersey?"

What Butter Color does.—Let me read for you what is said of butter color by those who use it. I hold in my hand a circular issued by a leading manufacturer of butter color wherein he gives a large number of letters from customers in recommendation of his product. This testimony is interesting, and it must be true for it all comes from the makers of "honest butter."

EXTRACTS FROM LETTERS, ETC.

"Your Improved Butter Color cannot be excelled. I cannot see that it makes any change in the flavor of the butter but even if it did not persons would naturally think that it did, for yellow butter seems to taste better than white, and of course it goes into the market better."

WILLIAM MOORE, Oronque, Kansas.

"We are more than satisfied with your Improved Butter Color. Winter butter colored with it commands a higher price, for it looks and tastes like butter made in the months of May and June."

MRS. JAMES COLLINS, North Amherst, Mass.

"I took a jar of butter to the store, but it was so white and lardy looking the store-keeper would not make me any offer for it. The other day I took some colored with your Improved Butter Color, and he paid me the highest market price."

MRS. J. W. LAWRENCE, Moscow, N. Y.

"Our winter butter will bring from three to five cents per pound more in the market by using your butter color; and as a fifty-cent bottle will color 1250 pounds, it makes it quite an object for dairymen to use it, for allowing that it brings only three cents per pound in selling 1250 pounds, it puts in our pockets thirty-seven dollars more than it would with it left out."

GEORGE W. HOWE, Middlefield, Mass.

"Several of my neighbors said they would not use anything to color their buttter, but when they had to sell their butter for fiteen cents per pound, and I was getting twenty-five cents, they changed their minds and are now using the Improved Butter Color."

MRS. H. P. DUNHAM, Lenexa, Kansas.

Now, Mr. Chairman, for the purpose of this argument it is unnecessary that I should go into any discussion of the immorality involved in the coloring of butter but I submit that if a handsome and agreeable color in butter adds to its market value five cents per pound; if such butter is salable, and white butter is not, or not so readily salable; if colored butter somehow or other tastes better, or we think it does, than uncolored butter—then it is likewise true that handsomely colored oleomargarine is more desirable, and more palatable than when it has the pale straw-color of its natural condition. If it is right to color butter—I do not say it is—but if it is right to color butter, and this coloring is allowed, there is no good reason in all fairness why a rival product, which is actually better, cleaner and purer than much of the so-called butter, should not be put upon the market in as handsome and inviting an appearance as the skill and science of its manufacturers enable them to make it. Nobody will dispute this proposition but a butter Pharisee, who thanks God that he is not as other men are, but colors his butter with oil and annatto, while condemning their use by others.

All Colors Objectionable in Food.—For myself, I do not believe in coloring any article of food. I do not believe in coloring white-wine vinegar so it may look as if made from cider. I do not believe in putting turmeric or saffron into baker's cake to take the place of eggs. I do not believe in adding ten years to the age of brandy by the aid of a few drops of Bowker's caramel. I do not believe in making skim milk into "Jersey" by the addition of annatto, and I do not believe in painting poor winter butter with the fresh grass tint of early spring. I do not believe in coloring oleomargarine. I am in favor of stopping all this coloring. Let poor butter be left uncolored so that we may just see how poor it is. Let oleomargarine be sold only in its natural color. I am in favor of all these things, but in common with every fair-minded person, I am opposed to legislation which as between poor butter and oleomargarine, discriminates against the better product, because this is the very height of unfairness and class legislation of the rankest kind.

Oleomargarine Sold Honestly.—But it is said that oleomargarine, as generally sold, is fraudulently represented as butter; that it cannot be sold on its merits, and therefore some legislation in regard to color is necessary to give warning to the customer, and inform him of the character of the article he is buying. To to this end it is proposed to prohibit the addition of any yellow color, and some go so far as to favor a requirement that oleomargarine shall be tinted red or even black. If it were true that oleo was not, and could not generally be sold on its merits, there might be some justice in the proposed remedy, but like almost every assertion made by the enemies of oleo, this is absolutely without any foundation in actual facts. Time does not permit that I should consider this statement at any length, but it is disproved by a mass of testimony before this committee and by the official statements of officers charged with the enforcement of laws which compel dealers to sell oleo for what it is and not as butter. The State Board of Health, charged with the enforcement of the food laws of the Commonwealth, say in their report published in 1889: "The protection afforded to the consumers in this State by three different sets of officers—the internal revenue officials, the inspectors of the State Board of Health, and the local inspectors of cities,—has undoubtedly restricted the fraudulent sale of oleomargarine to very narrow limits." The United States Commissioner of Internal Revenue, in his report for 1888, stated that as the result of a personal inspection in the cities of Massachusetts, he found a constantly increasing number of consumers who bought oleomargarine on its own merits; and in the report for 1889, the Commissioner says that it is "sold on its own merits, and has assumed its legitimate place as a cheap and wholesome food product." Such statements, from those whose business it is to know, must be regarded as conclusive. Further testimony is, perhaps unnecessary, but as directly bearing on this question, I think a little circular issued by one of the largest retail dealers in oleomargarine in Boston, is of great importance. This is the way the dealer advertises. He says: "Have you ever investigated oleomargarine for yourself, instead of trusting to what some self-interested person has told you? If not, we ask you to try it. Take home a pound. Don't tell your family it is butter; tell them it is oleomargarine. Show it to your family physician. Ask his opinion about it. All we ask is a fair show and the truth." When a dealer advertises his wares in this fashion, and when manufacturers advertise their goods in horse-cars, as is done in Boston, it

is beyond question that they expect to sell them on their merits.

The Poor Boarders.—I said a moment since that the dealers in low grades of butter had got down to their last ditch. They acknowledge it themselves. They are forced to admit that oleomargarine is healthful, and they reluctantly concede that the dealers almost universally sell it for what it is; but they exclaim triumphantly: "Most of the oleo is sold to boarding-houses and the boarders don't know what they are eating." The returns of the Revenue office prove that most of the oleo is *not* sold to boarding-houses, but it is doubtless a fact, that the unfortunate inmate of the ordinary boarding-house always has been, and probably always will continue to be, in blissful ignorance of the occult mysteries of its kitchen. For years the poor boarder has struggled with the hidden secrets of hash and sausage; remnants of veal have masqueraded in the chicken pie and superannuated fowl have put on the tender innocence of spring chicken. There are suspicions in the vinegar; doubts in the sugar bowl; grounds of uncertainty in the coffee-pot. The homeless victim of the boarding-house finds the pepper-box and the mustard-cup to be a perfect museum of the materia medica; the components of his tea would form a herbarium of indigenous botany. Root crops of every kind do duty in the horse-radish bottle. There is copper in the pickles, alum in the baking-powder, water or something worse in the milk. Mystic combinations everywhere surround the hungry guest who sits at the boarder's table, so that it is but the simple truth to say that the contents of the butter-dish are, like the other viands, obscure in origin and mysterious in composition. The butter may indeed be oleo. It may, perchance be butter and be something worse. It may be "hash butter," marked by the honest "dealer as "dairy or "creamery"—a mixture of a hundred kinds coming from "camps and dug-outs, huts and sheds, mud-cabins, croops and barns," all over the West, made "uniform and pleasing to the eye" by much abused butter-color. Boarding-house-butter may not be oleo—it may be pure, but it may also have done duty at many previous meals, and the remnants gathered up and made "pleasing to the eye" by the housekeeper carrying out on a small scale the tactics of the hash butter dealer. There are worse things than oleo in many a boarding house. The spectacle of philanthropy presented by a commission-dealer in ladle-packed goods holding the cover of a hash butter firkin marked "creamery," like a protecting shield ever the head of a defenceless boarder, warding off a possible attack of Bright's disease through the antiseptic properties of his own miserable compound, is as ludicrous in its pretentions, as it is contemptible in its hypocrisy. But coming down once more to hard facts, the census of 1885 showed that there were in the whole State, 2,122 boarding-houses and 831 restaurants. There were 310,248 dwelling-houses, occupied on the average by six persons. The great majority of the people of Massachusetts are people in moderate circumstances, who keep house. A very small fraction of the people live in boarding-houses. The great mass of the New England community are housekeepers, and the great mass of housekeepers are people in moderate or extremely moderate circumstances. Three thousand boarding-houses and restaurants cannot possibly consume the quantity of oleomargarine which the Farmer's League claims is consumed in Massachusetts. Allowing each boarding-house to have, on the average twenty boarders, and that each boarder required an ounce of butter per day, and assuming that every restaurant and boarding-house in the State used oleo exclusively, the quantity would be barely an eighth part of the oleo claimed to be eaten in the State during that time. The argument against oleo based on philanthrophic considerations for the boarders is as weak as all the others.

The Question of Competition.—The only remaining argument is that based on the question of competition. Massachusetts furnishes a market for 50,000,000 pounds of butter per annum, but her dairymen are unable to supply more than one-fifth of this amount. If oleomargarine were entirely excluded from the State, the competition between the 10,000,000 pounds of butter made in Masschusetts and the 40,000,000 pounds of butter brought into the State from outside its limits would be the same as now. The total prohibition of oleomargarine in New York State has not prevented the depression of the butter market which has been the same in New York City as it has in Boston. As has been repeatedly stated, oleomargarine competes only with low grades of butter, not the butter made on Massachusettes farms. This is generally of a superior quality and finds a ready sale at twenty-eight or thirty cents or more per pound, as testified here by several of the petitioners. At a recent meeting of the Readfield Grange, in the State of Maine, as reported in the *Lewiston Journal* of Jan. 2, 1890, Mr. R. W. Ellis of the Board of Agriculture, dwelt at considerable length on the profits of the dairy. He stated that he could make butter for thirteen cents per pound. Among hundreds of prominent butter-makers whom he had met no one claimed that it cost over fifteen cents. It may be made, however, to cost more than is received for it. He thought there was no danger of overdoing the dairy business im Maine. That State he said (and the remark is still more applicable to Massachusetts), "did not make anywhere near butter enough to butter her own bread." Thus it appears that the butter-maker selling his goods direct to customers, as most Massachusetts dairymen do, gets a profit of from 100 to 125 per cent. Is not this sufficient? As was stated by Mr. Ellis: "If any manufacturing business paid as much profit as butter-making, men of means would rush into it by the thousands." The conclusion of the whole matter is this: A large class of people want oleomargarine. They buy it knowingly and from choice, because it is cheaper and better than any butter sold within their means. They have always had yellow oleo, and they have never seen it of any other color, they have seen it of this color for more than ten years. The still want their oleo yellow, because that is the color to which they have become accustomed and because yellow is the common color of edible oils and fats. They do not want it to look white like tallow, any more than the butter consumer who does not fancy white butter, even though he has made it himself and knows it is pure. Consumers of oleo do not want their artificial butter to be made the color of lip-salve, or blue like mercurial ointment, or of the complection of shoe-blackening. They have the same right to eat yellow oleo that they have to sit down to a pine table painted in imitation of black walnut or to use silver plated teaspoons. The whole opposition to oleomargarine originates in adulterated selfishness. It is not fraud which troubles the conscience of the dealer in poor butter. Many of his own goods are dishonestly branded. It is not solicitude for the public, or consideration for the boarders which animates the greedy butter-maker. It is the fear—an ungrounded fear so far as it concerns fine butter,—but a fear nevertheless of competition, and a belief, equally erroneous, that with oleo out of the way, or made objectionable in appearance, butter prices would be higher. As a recent writer has said: "Give oleomargarine a fair field and equal rights, and it will drive common and dirty and badly-made butter out of the market, and it will drive the speculators and the would-be cornerers of the butter market out of existence." The farmers of Massachusetts, properly informed of the real state of facts, will cease to be troubled by the oleomargarine question. Let me read you in conclusion, a short extract from an address to farmers, made at a meeting of farmers, by Mr. James Cheesman, Secretary of the New England Creameries Association. Mr. Cheesman says: "Oleo does not compete with good butter. The goods that are injured by its rivalry are the product of men who don't understand their business. The men who show most hatred towards this substance are those interested in the sale of ladel-packed goods, or hash butter. These goods are packed by store-keepers in the West, and shipped East to depress the butter market. Kept in refrigerator cars and cellars in eastern cities the process of deterioration is arrested till the goods reach the consumer under some fancy name of 'dairy' or 'creamery,' or whatever the fertile brain of the salesman may suggest. These goods and not oleo do more to depress your business in the city of Boston and adjoining cities, than anything else." If the farmers would do a little investigation on their own account they would cease to be the cat's paw of butter speculators, or the dupes of demagogue newspapers. Agricultural politicians would find their occupation gone. If they were elected or appointed to some office, it would be on the ground of fitness or ability, and not because they were sound on the butter question. I will not trespass further upon your time, but close with the admonition: "Prove all things. Hold fast to that which is good." I believe that oleomargarine is good. I believe it has come to stay, and I believe it will stay yellow. When the day comes that the butter people, and particularly the hash-butter manipulators, are willing to put their goods upon the market in their natural colors, the oleomargarine manufacturers will meet them on equal ground, and will cheerfully agree to the abolition of all artificial color, confident that the intrinsic merit of their products will insure their continued growth in the good opinion of the masses.

POWDERED MILK.

A PROPOSED SUBSTITUTE FOR THE LACTEAL LIQUID.

The idea of reducing cows' milk to a dry powder, and shipping it in this condition all over the world, seems to have originated with Dr. Krueger, a Swiss savant, and under his management a company was organized to make milk powder in Switzerland. It is claimed that milk in this form is much better than canned or condensed milk; for one reason, it has no sugar in it. It is well known that condensed milk cannot be used in many departments of cooking on account of the sugar, and this also makes it objectionable for use with very young children, not that the sugar itself is injurious to the babies, for it is always put into their milk, we believe, but it is better that this sugar be put in fresh at the time of preparing milk for the child. How far this powdered milk will answer these objections remains to be seen. One thing is certain, the powder will be much better for transportation and more handy to have in the house than either plain or condensed milk, provided it is a success. It looks somewhat dubious as a complete substitute for plain milk, not only on account of necessary expenses, but we do not find any kind of food capable of being thoroughly dried and afterward made over with water so as to closely resemble the original article, and we never expect to see it done with cows' milk. Nature has a way of mingling these things that thus far man has not been able to closely imitate.—*American Dairyman.*

SULPHUR NOT AN ELEMENT.—At the October meeting of the Vienna Academy of Sciences, Theodor Gross, of the Technical High School of Berlin, présented a paper of a very startling character, in which the author endeavored to make it plausable that sulphur is not, as now considered, an element, but a compound of carbon with some other as yet undetermined elementary substances.

TO RECOGNIZE AMBER.—Amber may be distinguished from its imitations by the following characteristics: Copal is yellow and always of a uniform color, while amber is generally shaded and striped or cloudy, and when rubbed with the palm of the hand, it evolves an aromatic odor, which is not the case with copal or artifical amber. Amber when coated with tallow, and held over the fire a few minutes may be bent, while its substitutes remain rigid. It is crushed with difficulty, cannot be abraded or scratched with fingernail; it can be cut, filed sawed and polished, but it cannot be welded, like copal or artificial amber..

THE IGNORAMUS.

A COMPREHENSIVE DESCRIPTION OF A VERY COMMON CHARACTER.

The ignoramus is a very numerous and very important individual in society to-day, as he always has been. He is a noun of multitude, and is the sum and substance of all multitudinous movements. As a general rule, in science and literature, he is fascinated with famous names, and cares for nothing which has not a multitudinous endorsement. He likes to speak of Plato and Aristotle, without knowing a page of either, and thinks the names of Emerson, Tennyson, and Browning adorn his conversation. In science he is very sure to refer to Huxley and Tyndall, but what they have written he could not tell if questioned. Yet he is easily caught by pretenders. If Mrs. Eddy assures him there is nothing in the universe but God, and consequently that he is a large part of God and capable of doing miraculous things, the doctrine delights him. But as to Spiritualism—he is very suspicious; he thinks it must be a very dangerous and demoralizing system, because Talmage or some one of his kind has said so. If he wishes to investigate its truth because somebody has told him a wonderful story, he goes to the most notorious impostor who has the largest handbills. He knows nothing of the able works on this subject, and reads nothing but the buffoonery of some newspaper reporter as ignorant as himself. He fills the halls and the pockets of Ann Eva Fay, Bridge, Star, Lincoln, and other impostors of that class. When it is advertised that a piano will float in the air, and ghosts appear numerously in the theatre, he is sure to be there, and thus he discovers that there is nothing in Spiritualism. He visits Mrs. Elsie Crindle Reynolds, on the assurances of gullible Spiritualists, and there confirms himself in knowing that Spiritualism is all fraud. He runs to hear Mag. Fox tell her idiotic falsehoods, and there attains the most positive knowledge, and fills the entire measure of his intellectual capacity, which is fortified against enlightenment by the assurances of Bishop that clairvoyance is only muscle reading. Of animal magnetism he had a very contemptuous opinion, until some one assured him that every man was a natural magnet, and if suspended from his centre of gravity by a wire with an exact equipoise, his head will point exactly to the North Pole! This, together with the assurance that the Faculty in Paris were investigating animal magnetism, under the name of Hypnotism, gave him great hopes that there might be something in it. In politics he is especially multitudinous. He makes processions several miles long to prove that some candidate ought to be elected, and demonstrates his political philosophy by carrying a thousand blazing torches at night, on which occasion his eloquence is irresistible, for he yells by the half hour. Whether he maintains that Cleveland will ruin the country by free trade, or that Harrison will ruin it by Chinese immigration—he proves it by a prolonged yell. He yells to prove that Cleveland has sold himself to the British, or that Cleveland is vigorously twisting the British lion's tail. He swells to a hundred thousand at New York just before the election, and at the head of the procession of howler's, the leaders, as described by a reporter, in the most wholesouled manner "flung both hands in the air, hat in one hand and flag in the other, bent themselves nearly double, stamped on the ground, and yelled with all their might, so that, if any one should show these men instantaneous photographs of themselves, they would emigrate forthwith to some vast wilderness, and meditate upon the utter craziness of men with politics on the brain." But Ignoramus has been quite harmless of late —he only wishes to demonstrate that Mr. Blaine is the greatest statesman in the world, or that Mrs. Cleveland is a queen, or a goddess, of ravishing beauty. Ignoramus is sometimes disturbed with serious thoughts of the future. He is very much afraid that women will lose all their charms, forget their duties, and neglect their duties if they are allowed to vote; and he is afraid that everything will go to ruin by *inflation* of our money system. He fears that if our energetic people have as much money *per capita* as they have at present in France, they will fall into ruin financially, for somebody has told him that *inflation* is dangerous; too much money and too much liberty are his scare-crows. He thinks that doctors who cure people without having college diplomas are very dangerous to society—but at the same time he is quite sure to run after the doctor who has the most ostentatious advertisement. In all things he is a *quid nunc*, looking for something sensational, and Talmage is his *beau ideal* of a clergyman. He admires, too, the Rev. Dr. S., who after his manuscript written in Sanscrit was interpreted by a psychometric medium, hurried away to escape from the works of the devil.—*Journal of Man.*

NINETEENTH CENTURY FETISHES.

SUPERSTITIOUS BELIEF IN CHARMS AND NOSTRUMS STILL MAINTAINED IN CHICAGO.

It was in a much frequented and flourishing drug store on State Street, in that portion of the noble thoroughfare where vice and crime lurk close within the shadows of business respectability, where all nationalities and colors throng the sidewalks and crowd the cellars over which prosperous merchants drive a thriving trade and busy warehouse men pursue their multiform occupations. In the drug store were several customers, and among them a motherly little woman of middle age, quite decently attired, but with pale, care-worn features. She stood as if pleading with the proprietor at a rear counter, and while it was evident from his words and gestures that he could not or would not supply the article she wanted it was equally apparent from her's that she did not believe his assertions and considered herself an ill-used customer.

"Did you ever hear anything like that?" inquired the druggist of a bystander who had been watching the scene with some interest.

"What was the trouble with the old lady?"

"Why, she wanted something that we certainly don't keep. She was begging hard all that time for some dead man's fat—and it was to rub on her sixteen-year-old son, who is wasting away; and she is positive that it is the only thing on earth that will save him. I told her, of course, that no druggist keeps such stuff, and how silly it is to regard it as a remedy, but she has picked up the remnants of an ancient superstition somewhere and will stick to it, womanlike, as long as there seems a chance to gain the object. It is astonishing in a city where there is so much reading how those musty old medical fables still survive among the people."

"What is the origin of this notion?"

"Oh, it is one of the hundreds of specifics like it that were accepted, even by the faculty, before medicine had developed into a logical science. I find it quoted from a London pharmacopeia that 'ye fatte of a man is exceedingly goode to anoint such limbs as fall away in fleshe.' That is the foundation of the woman's absurd demand, and we get plenty of the same kind of customers, I assure you."

"The ash of human bones is a merchandise sometimes called for, and is held by its admirers to be a sovereign remedy when taken internally, for consumption and other maladies in which there is much wasting of the tissues. Dog fat is also a great favorite, and I have sold, perhaps, fifty pounds of it right here on State Street. Consumptives are somehow made to swallow it, and there is great faith in its efficacy among Teutonic and Scandinavian customers, even those of the reading and intelligent class. A fellow called in here not long since to sell me five pounds of it, and I fancy that the loss of many a well-fed pug, vainly advertised and mourned by its mistress, could be thus accounted for by men of his stripe."

"Of course it is idle to ask you if there is any efficacy in such medicines?"

"Well, I wouldn't say there is none. There is much that we cannot estimate in the remedial power of imagination. Sometimes it has been found that a so-called popular delusion may really have a basis in scientific fact. For instance, the tumor known as 'goitre' was once believed by the masses in the countries where it prevails to be positively amenable to treatment with the ashes of burnt sponge. This the doctors set down as a mere superstitious fallacy. In time, however, as chemical analysis became a part of medical research, the principle called iodine was discovered among the elements of common sea water. By the chain of reasoning suggested, the French chemist Coindet imagined this new principle might be useful in goitre. It proved itself an almost infallible specific for the hitherto incurable disease, and, as iodine is involved in the burning of sponge, it became at once manifest that the populace had not been wholly deceived in their belief in the curative properties of sponge ash. How the knowledge originated is another matter. With regard to a dog's fat, I see no reason why it should not be as nutritive as cod liver oil, if the great danger of swallowing internal parasites is ignored. As much might be said for human bone-ash. It contains the very phosphates of lime which we now deem so healthful in cases of debility."

"Are there any other fanciful specifics of this character?" "Numbers of them. Southerners generally, and especially colored people, appear to have an innate confidence in such things. For the skin eruption known as 'shingles' they insist that there is nothing better than the tip of a black cat's tail, and many a poor mouser has yielded up his caudal appendage an unwilling sacrifice to this strange faith. Skunk oil is another agent frequently called for, and is, in fact, kept in stock by some Chicago druggists. It is brought here for sale by men who trap the creature for this purpose, and my colored friends on Polk street claim it to be a relieving agent for rheumatism. Scores of people in Chicago believe that so long as they carry half a potato in their pockets they will be free from this disease. The Hebrews along Clark street place their trust in goose oil, which they use as an embrocation; or in cases of croup and various throat affections, mix it with vinegar and administer it internally. The Irish also believe in its virtues, but they keep it so long stored up in bottles that it turns rancid and is then poisonous. A very singular specific is rattlesnake oil, which is still asked for occasionally. At one time it was sold in considerable quantities, and even now, though less in demand, it is still believed in by some as a last resort in almost every bodily ailment. How any one can be persuaded to swallow it is to me incomprehensible. Castor oil is nectar to it. A druggist is not always told what the articles supplied are required for, but any one who has been long in the trade can usually give a pretty shrewd guess. Here is a jar of loadstone (magnetic iron ore) in broken lumps. The purchasers of this, who are chiefly of the gambling fraternity, sew up a small piece in chamois skin and carry it in their pocket or round the neck as a talisman. There are little horseshoe magnets kept by some dealers which are merely an ornamental form of the same disease. But the principal trade in such charms is done by slick individuals who go round and sell them from house to house, in gambling haunts and saloons. Gamblers are noted for their credulity and superstition. One of the fraternity came in here some time ago and asked me to procure for him the bone of a woman's finger. He would not say for what purpose he required it, but it was to be the joint on which the wedding ring is usually worn, and he offered me $5 for it. I referred him to the medical colleges as a probable source of supply, and I heard later from a physician that quite a trade was formerly done in these ghastly amulets by men who had access to dissecting-rooms. As high as $25 has been paid for such a relic, and a certain working-man at the Polk street freight depot used to carry about with him three or four at a

time for sale. He could always find customers for them among the gambling fraternity, who believe in their potency as 'lucky bones.' Mixtures which are supposed to bring luck into a dwelling are quite in our line. We frequently make up pastiles or compounds for the denizens of Third or Fourth avenues which are a mixture of Dragon's blood, frank-incense, myrrh and asafetida, in certain proportions which their messengers indicate. This preparation is sprinkled over live coals on an iron shovel and thus carried from room to room as if for fumigation. The real design is, however, to bring luck to the inmates, with which view it is even burned out on the side-walks. This charm is especially favored by colored women. Superstition of some sort attaches to nearly all drugs with a strong and pungent odor, and especially to the heavy, tomb-like fragrance of patchouli. There are clairvoyants and fortune tellers who buy these things of us wholesale for the purpose of combining them in various vials and retailing ing them to the credulous unfortunates on whom they live. A periodical visitor here is the young spooney of seventeen or eighteen, with very high shirt collar, but only a suspicion of mustache, and who mumbles a demand for what he calls a 'love powder' or some 'love drops.' The same request is often preferred by young girls and also by women who are old enough to know better. The only way to satisfy these is to refrain from laughing at them and to furnish some little compound of an entirely harmless nature. As a powder we give them wheat flour, slightly perfumed and colored with cochineal; while an ounce of rose water, colored with a few drops of the tincture of cochineal, will satisfy the most greedy of them as a love portion.—*Chicago Herald.*

ROMANCE OF A ROAMER.

THE ENDING OF A CAREER OF AN ECCENTRIC WANDERER.

The motions of the celestial bodies are, for the most part, so regular, and governed by laws so majestic, that we are apt to suppose, there can be no departure from perfect uniformity in the "clockwork of the skies." The study of the perturbations produced by the mutual attractions of the planets upon one another nevertheless forms one of the most important and intricate departments of astronomy. When we come to look at the solar system as a family of globes, all under the dominance of the sun and yet all, so to speak, pulling and hauling upon one another as they swing in the yoke of solar gravitation around their great attractive centre, we see that none of them moves in the smooth ellipse, as the books teach, but that all go swaying and leaning in their courses, now a little this way and now a little that way, and by their varying attraction even moving the sun, like a hub that fits loosely on its axle. But these disturbances of the planets are small when measured by the vast distances embraced in their orbits, and can only be detected by careful observation. With comets the case is different. Their mass even in comparison with the smallest planets, is so inconsiderable that the effects of their attraction upon any planet are imperceptible; but, on the other hand the attraction of the planets upon them may suffice completely to change the direction in which they are travelling. This is almost certain to be the result if a comet goes very near to a large planet. With respect to wandering comets, the planets constitute a well-organized police force. Jupiter, the largest of the planets, has played strange tricks with several of the comets that have ventured too close to him and his little flock of moons; and Jupiter is one of the three chief characters concerned in the somewhat romantic history we are going to relate. The bright skies of the past week have perhaps given astronomers their farewell glimpses of a comet that had been lost for more than a hundred years when it suddenly and unexpectedly made its appearance sunward bound last summer. This comet, for there seems to be little doubt of the identity was first seen in 1770. It was then found to be moving around the sun in a small ellipse in a period of about five and a half years. It completed only two revolutions in this orbit, and then in 1779 disappeared as suddenly as it had come. Careful calculations, based upon its observed motions, showed that this strange comet had been the sport of Jupiter. In the year 1767, while journeying through space at a respectful distance from the sun, far beyond the reach of terrestrial eyesight, and apparently safe from those perturbing influences that may disturb the even tenor of a celestial body's existence, it fell in with Jupiter. It was a pretty narrow escape from an actual collision. The comet ran in within the orbital distance of Jupiter's outermost satellite. It was literally made a prisoner on the spot; not to Jupiter, though the giant planet was its captor, but to Jupiter's chief the sun. The effect of Jupiter's attraction was to throw the comet out of the broad free curve, the highway of open space in which it had been travelling, into a short ellipse having the sun in one of its foci; and in this ellipse the captive was journeying when discovered from the earth in 1770. Henceforth of its own accord it could not get further away from the sun than the point where it first encountered Jupiter. On the other hand it could not avoid another encounter with Jupiter whenever it should be in that part of its path that lay near the orbit of Jupiter at the time the planet should arrive in the same neighborhood. This occurred in 1779 when the comet had made only two revolutions around the sun. Again Jupiter seized the intruder, and, apparently thinking the Court had discharged the prisoner, gave him, like any disappointed policeman, a farewell kick. But Lexell's comet, as the adventurer has come to be called, was not yet done with the perils and tribulations of the solar system, into whose apparently well-ordered and peaceful precincts it had incautiously ventured. Jupiter's kick did not end its troubles. The biggest member of the celestial police had simply mistaken the intentions of the sun. The prisoner was not discharged, the law of gravitation still held him in its grasp, and Jove's boost only sent the unfortunate comet whirling in a new ellipse vastly larger than the other, with one extremity extending beyond the orbit of Saturn, but still having the remorseless sun in the opposite focus. At this juncture the comet disappeared from the sight of its watchers on the earth. Its perihelion distance was now so great that it could no longer enjoy the poor privilege of displaying a tail, and so get some compensation for its sorrows by frightening the timid inhabitants of the planets it had fallen among. But the eye of the mathematician was upon it and his fine science traced its invisible course through the heavens, and foresaw that again it would fall within the grasp of Jupiter. That event happened in 1886. Jupiter made no mistake this time. He recognized the old offender, and sent him sunward in a hurry, and now the prisoner of space is treading the galleys once more before the eyes of men in an elliptical orbit whose period is seven years. The comet's woes are not ended yet. The calculations of Mr. Chandler show that it will fall in with Jupiter yet a fourth time in 1921. Just what Jove's mood will be then nobody can foretell. Perhaps he will send it wandering in a yet more remote orbit than its former one; or he may adopt it as a permanent member of his own family of satellites, as nearly happened in 1886. There is reason to suspect, however, that the comet will not survive to travel in many more orbits, for it is evident that their last encounter, Jupiter, metaphorically speaking, made a rather too free use of the club. The comet emerged from the planet's neighborhood with its head literally broken. There was a clear separation, as shown by the telescope; and this resulted from the disruptive strain of the attractive forces to which it was subjected on its close approach to Jupiter. When it again encounters that planet the disruption will probably go further, and the ultimate result must be the transformation of the comet into a swarm of meteors. And so will end the strange eventful history of this wanderer of space, which, although it has fulfilled neither the functions of a sun by giving light nor of a planet by bearing life, but has apparently been the plaything and helpless victim of those vast laws that have made the universe, is yet in its essence as indestructible a part of the creation as the terraqueous globe. If Jupiter has inhabitants, it is not a violent stretch of the imagination to suppose that some day they may have fragments of the disinteregated comet of Lexell displayed in their museums, just as we possess a piece, or at least have reason to think we do, of the lost comet of Biela, which went to pieces some forty years ago, and whose meteoric debris have at intervals since then come like a fiery spray into our atmosphere when the earth and the remains of the comet have met at the crossing of their orbits.

One cannot turn from the contemplation of the wonderful effects wrought by the interacting attraction of the heavenly bodies without a clearer and deeper sense of the unity that binds the hosts of the stars together, and magnifies the importance of the earth by attesting its relations with infinite space.—*Sun*

SPURIOUS ANTIQUITIES.

IMITATION RELICS OF OLD TIMES MADE TO ORDER.

The rage for having furniture of the antique pattern has grown wonderfully during the last few years. Antique oak dining suites, bedroom suites, and hall furniture seem to be the most popular, but anything of an antique character now sells rapidly. Many purchasers who are furnishing their houses really believe that they are buying furniture which some old time Puritan had used. In this they are greatly mistaken. Antique articles are manufactured every day in the different warehouses. A furniture dealer was recently interviewed by a New York reporter on this subject. He said: "A few years ago agents used to be sent all through the rural parts of New England to pick up superannuated furniture of every kind, such as was found astray in farm houses, village attics, country hotels and elsewhere, having been handed down from generation to generation in the families of long-resident natives. The latter were usually willing enough to part with the treasures, which were only valuable in the eyes of people of æsthetic tastes, and the dealer paid a mere song for the articles, reaping a big profit. But now the supply obtained in this way has been practically exhausted. Now it is the fashion for rich Yankee people to have in their houses one or two apartments in the old colonial style, with floor and walls of dark oak, massive rafters, huge fire-place, mahogany furniture, and an occasional spinning wheel. There are not nearly enough of these precious relics to go around, so it is a blessing that provision is made for reproducing them indefinitely at comparatively cheap rates. The most approved method of giving a floor or wall a look of old age is to scrub it at intervals with gallons of old ale. This produces a fine effect. Mahogany is generally used for the manufacture of antique pieces of furniture. In its natural state it is no darker than black walnut, and, to make it of the proper hue, staining must be resorted to. If oak is wanted, it is rubbed with common shoe blacking, and the usual wax finish put on afterward. This is warranted to add fifty years to the apparent history of a bureau or desk in one hour. For the inside works of said desk or bureau, pine is employed, and this is given the requisite look of antiquity by repeatedly firing a shotgun loaded with nothing but powder, and plenty of it, into the drawers and around them until the surfaces exposed are sufficiently discolored and all full of those curious indentations which ordinarily indicate age. Another process is to wash the drawers, etc., with a coarse sponge dipped in powerful acid, which eats wood here and there, and effects the same

result. Brass fittings are manufactured in all the ancient designs that were ever used. In order to make them look dull and old, the moulds in which the brass is cast are rubbed and chipped somewhat, and in them a little gunpowder is placed and fired with a match. This occasions a discoloration, which seem to betoken the action of time's gnawing teeth, and the same is warranted to last until the merchandise is sold, though not much longer. A special branch of the work has to do with clocks of the ancient upright pattern, which are copied in every detail from the really old one. Even the metal faces, with their curious numerals, are imitated, and the works of modern pattern are permitted to lie in a dusty corner and oxidize comfortably while the framework is in process of construction. There is nothing, the makers say, in the line of back number furniture that cannot be reproduced at a few days' notice from brand new materials, and yet so like the old that no ordinary person could possibly tell the difference."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

March.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, veal.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Bass, cod, snipe, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish, trout.

VEGETABLES.—Artichokes, beans, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress.

FRUITS.—Apples, bananas, oranges.

PRACTICAL RECIPES.

GUMBO SOUP.—Cut up a large fowl or two small ones as if to fry, and break the bones, lay the pieces in a pot with just enough butter to brown them a little, when brown add a chopped onion, a slice of lean bacon, some parsley and enough water to make sufficient soup for four or five persons. Cook gently for five or six hours; about twenty minutes, before serving pound fine a heaping tablespoonful of sarsafras leaves, mix them well with a little of the soup, then add to the soup, season and serve.

BEEFSTEAK AED OYSTER-PIE.—Beat a thin steak gently with a rolling-pin, cut it in pieces and season with pepper and salt. Line a baking-dish with not too rich pastry and put in a layer of meat, then a layer of oysters and so on, over the top layer pour the oyster juice with a little mace and a teaspoonful of catsup; cover with top crust and bake. Veal may be used instead of beef.

TOMATO SAUCE FOR MEATS.—Quarter ten tomatoes and put them in a saucepan with a little parsley, thyme, four sliced onions, a clove and quarter of a pound of butter. Let them cook not too hard, stirring occasionally, for three-quarters of an hour. Strain through a sieve, season with salt and pepper and serve.

CARROT SALAD.—Scrape some very tender, rich-colored carrots and boil them briskly till tender, cut them in very thin slices and put them in a glass salad-bowl. Sprinkle with sifted loaf sugar and pour over them the juice of a large fresh lemon and a wine-glass of olive oil Garnish with very thin slices of onion and small lettuce leaves.

CHEESE FONDU.—Heat one pint milk to boiling point, add to it a large tablespoonful of butter. Put in a bowl a pint of not too rich minced cheese and one pint of bread crumbs, two well beaten eggs, half a nutmeg and one teaspoonful of salt. Pour over these ingredients the boiling milk and mix well; cover the bowl with a plate and let it stand on the back of the stove three or four hours to dissolve, stirring now and then, and taking care that it does not cook. Half an hour before supper time butter a pie-dish and pour the mixture into it. Brown in a quick oven and send to table very hot. It is necessary for success that the cheese be quite smooth and all dissolved.

SEYMOUR PUDDING.—Half a cupful of molasses, half a cupful of sweet milk, half a cupful raisins seeded and cut in halves, half a cupful of currants, half a cupful well chopped suet, half a teaspoonful of soda, one egg, one and a half cupfuls of Graham flour, spice and salt to taste. (One teaspoonful grated nutmeg and one of allspice, has been found very nice.) Boil or steam two and a half or three hours serve with hard sauce flavored with brandy.

COMBINATION BREAD.—One pint each of sifted yellow meal and rye flour; pour in a pint of boiling milk and let it stand until cold. Sift together a pint of wheat flour, a tablespoonful of Horsford's baking powder, a full teaspoonful of salt, a tablespoonful of sugar. Mix these with the meal mixture, add an ounce of creamed butter, and cold water and milk enough to make a stiff batter or dough; shape quickly into loaves, put these in hot, buttered tins and bake an hour; the first half hour, keep the loaves covered.

BLOOKER'S COCOA.

A LITTLE COMPARISON OF THE ADVERTISED ADVANTAGES AND THE REALITY.

Somewhat astonished by the claims made in the newspaper advertisements of Blooker's cocoa, we invested 55 cents at a grocery store and purchased a half pound tin. The package was wrapped in paper marked Blooker's Dutch Cocoa. Within was a tin box labelled and wrapped; around this a printed circular which after mentioning the nutritious quality of the beans of the cocoa plant, speaks of the "great difficulty heretofore found in endeavoring to separate the indigestible properties of the cocoa bean from its nutritious parts. It remained for us after years of careful research to invent a practical method of effecting this separation on a large scale." Then follows this paragraph:

"The most expensive but the cheapest! This bold assertion may sound contradictory at first, but is capable of proof; we affirm that we do not desire to compete with any other so-called cocoa, which in reality however is, in many cases, but spurious adulteration, a compound of the cocoa-bean in its most indigestible crude form with starch, arrowroot, sugar, etc. Yes! We boldly admit that our cocoa is the most expensive cocoa sold to the public, but then it is the only genuine article produced and we guarantee it to be."

This cocoa is sold at retail at $1 per pound and 55 cents per half-pound tin. The half-pound tin with its wrappings weighs 11¾ ounces. On the label around the box are the following "Directions for use: Put a spoonful of granulated sugar into your cup, add a spoonful of cocoa; mix them well-dry, then pour on boiling water (or boiling milk) and stir well, you have then a cup of this unrivalled cocoa ready." The half-pound tin opened contained exactly eight ounces net. This made twenty-eight heaping teaspoonfuls or forty-five teaspoons even full. It is advertised to make 75 cups of cocoa. Taking an ordinary teacup and mixing Blooker's cocoa and granulated sugar, a spoonful of each, dry, according to directions, then pouring on boiling half milk and half water, we naturally expected to get what the advertisement promised, "a cup of this unrivalled cocoa," but, alas! we had not understood the word "unrivalled" in the right sense. It was unrivalled slop, for the taste could not be well compared to anything else than hot water and milk poured on a cup of the leavings of any good American cocoa. It would have been taken with perfect impunity by the worst dyspeptic more confidently even than Epp's or Alkethrepta, because it contained little more than a faint suggestion of cocoa and bore the strongest resemblaece to dishwater. It is quite possible that by taking two or three times the quantity of this Blooker's Cocoa that we took we might have obtained a cup of something that would taste like cocoa, but that is not what the directions said. Perhaps the directions meant a tablespoonful, but in that case it would make this cocoa the most expensive cocoa in the world, because the half-pound tin contained only twelve tablespoonfuls. As we have shown in a previous number that there are American cocoas in the market, known to be strictly pure and made of only the finest cocoanibs, without the addition of any worthless shells, injurious alkalis or other adulterations which are sold at fifty cents a pound, we can see no reason why consumers should pay one dollar a pound for an inferior article on the pretence that it is, though the dearest in price, really the cheapest. The American cocoas, like Baker's, would be infinitely cheaper at one dollar a pound than Blooker's at fifty cents. Another thing may be added here that it is an open secret that all these so-called Dutch cocoas are manufactured on a formula which the inventor offered for sale to the manufacturers in this country, claiming for his process the questionable advantage that by its use the mannfacturer could use inferior cocoa beans and their taste would be completely masked by the process of manufacture. Our American manufacturers were at least too shrewd to invest in such clap-trap, leaving it for their Dutch competitors to manufacture goods in such dubious ways and trusting the success of their sales to specious advertising. So far the success of the Dutch cocoas notwithstanding this voluminous and romancing advertising, has not been very striking and American manufacturers hold their own.

A CLOCK WITH A CAUTION.

A CLOCK WITH STRANGE POSSIBILITIES, ATTRIBUTED TO EDISON.

Thomas Edison, the phenomenal inventor, has reached a critical stage in his career, and it would be a strange criticism of faith, if his latest invention should make him positively abhorrent to the growing generation. Over in his laboratory at Llewellyn park is this invention. It has been tried and found perfect, and it is a phonographic clock, which, instead of chiming the hours, calls them out at every quarter in a voice full of clearness. It may be fitted with any set to suit the purposes for which it may be intended. To a reporter it was exhibited yesterday. The inventor was cheery and playful, as he always is. "The clock," said he, "is an improvement, and if it were only in the market now it might save your reporter a great deal of worriment. For instance say, you are at a political meeting with a dozen speakers carded. They are to have a half hour. You know what a fiction that is. But now, if you had a clock like this, see how it would work," and here Mr. Edison placed a set within it. He pointed the hand to the quarter of an hour, and a voice came ringing out: "This speaker is half through." At the half hour the clock blurted out: "The audience will please not encore. The gentleman now gives way to another." "The only fear I have," continued Mr. Edison, "is that the young unmarried folks may not relish it. You are married? No? Well, I don't give this out as a bribe, but when you get entangled in the preliminaries come to me and I will give you one that you may present to the family into which you may aspire to be admitted. It will be a fibber. I'm a little in doubt about the popularity of the parlor clock with the younger people." Mr. Edison has good cause to fear. A more tantalizing ornament to a pair of ardent lovers than a matrimonial parlor phonographic clock cannot be imagined. Fancy,

for instance, a Sunday evening in a cozy parlor with two hearts beating as one, startled by a voice from the mantel: "Good night, a fond good night, In another hour it will be midnight." Then dolefully at a quarter past and each succeeding quarter comes out in its hoarse croakings, until 11.55, when it blurts out: "In five minutes more it will be to-morrow," and every ten minutes subsequently the air is filled with its maudlins, such as: "Ah! how still the hour." "Mabel, I am watching thee, ha, ha!" "Methinks I hear the spirit of thy mamma upon the stairs." "Please, don't heed me; it is my misfortune that I must warn you that the hour is half past twelve." "Did I hear you ask me to get that hat?" "Will you kindly remember me in your prayers?" "Look out! I hear a foot-step. Ha, ha! I was only fooling thee. I'll soon have to call father to go to his office." And so the clock jabbers on most exasperatingly. Of course the words are set to suit the circumstances. If the wooer be a favored person of course the language will be different, the tone of the clock will be sweet and shivering, and the words coy and captivating.—*Press.*

More Truffles.—A new truffle field of wide extent is said to have been discovered near Mussorie, India, and epicures abroad are letting their mouths water in anticipation of a more abundant supply of the delicacy hereafter.

African Ivory.—One of the possible results of the development of Africa will be the increase in the supply of ivory. The annual slaughter of the elephant on that continent at present reaches 65,000. The ivory product is worth $850,000.

Electric Statistics.—Mr. A. J. De Camp, of Philadelphia, has circulated a petition asking Congress to appropriate the small sum of $50,000 for the purpose of investigating electric lighting, not only with a view of ascertaining the figures that represent its growth, but especially with the object of inquiring into the casualties that have resulted from the use of electric currents, and as compared with casualties from other agents employed for similar purposes. This is a timely appeal.

Alpine Railway.—French engineers are planning for an attack upon that hitherto virgin peak of the Alps, the Jungfrau. They propose to continue the present line of railroad from Interlaken to Lauterbrunnen as far as Stockelberg, at the foot of the Jungfrau, and thence to mount up by a succession of slanting cable roads, forming a zigzag, to a height of some twelve thousand feet, landing nearly at the summit of the mountain.

South African Gold.—Notwithstanding all the predictions of wonderful richness, the Transvaal gold fields did not make such a remarkable showing last year. The whole of South Africa only produced $8,000,000; and instead of there being 2,000 stamps dropping with a monthly product of 75,000 ounces, there are only 35 mills with 900 stamps, and far less than that many ounces per month.

Greased Logs.—In default of snow the Northern Pennsylvania lumbermen have covered the log "slides" with crude petroleum. It works fairly well.

Uses of Mica.—Mica is now being used as an electrical insulator, while preparations of it are said to form an excellent lubricant for machinery, so that the field of use for this material—hitherto chiefly used for stove doors—is rapidly extending.

Electric Lighting.—Whipple's electrical report for January shows that the total number of central electric light stations in the United States is 1,265. The total number of gas companies is 981, and of these 237 operate electric light plants in conjunction with their gas business.

Walk Your Horses.—The Brooklyn Bridge is, perhaps, the only suspension bridge in the world over which horses are allowed to trot. There is an old theory that the trotting of a horse, or even of a dog, or the sound of music, or the measured tread of soldiers marching, will cause dangerous oscillation, and weaken, if not destroy, the strongest bridge.

Inconsistency.—Some men will get up out of bed at night in the coldest winter weather to go to a fire, who cannot be induced to get up at 7 o'clock to start one in the kitchen stove.—*Somevville Journal.*

Telephones.—More than 170,000 miles of telephone wire are in operation in the United States, over which 1,025,000 messages are sent daily.

Soup and Colds.—One of the most successful remedies in influenza has been found in hot soup, strongly seasoned with capsicum, a teacupful to be taken every two hours. Any kind of soup will answer better than beef tea.

URIC ACID.—Dr. Haig believes that there is a relation between retention of uric acid in the blood and a state of mental despondency. When uric acid is present in excess, depression of the mind and irritability of temper are marked, but give place to a feeling of mental buoyancy when the excess is gotten rid of.—*New Remedies.*

BY RAIL TO EUROPE.—The Russian Government, it is said, will begin next spring to build its 4,500 mile railroad across Siberia. It is a big undertaking, and the estimated cost is $220,000,000. This is an age when the cost of any project, however, enormous it may be, provided it gives promise of a reasonable profit, is no longer considered an obstacle.

GENUINE DIAMONDS.—The following is a very simple test to tell whether a diamond is genuine or not. Place a small dot on a paper, then examine the dot through the diamond. If there appears but one dot upon the paper the stone is genuine, but if there appears more than one, or the dot is expanded or diffused, the stone is an imitation.

FLORIDA ORANGES.—There are in Florida about 10,000 orange growers. The acreage is 100,000, and the capital invested is from $60,000,000 to $75,000,000. Three seasons ago there were produced 1,250,000, boxes, two seasons ago 2,100,000, and last season about 2,500,000 boxes. It is estimated that the crop of 1890 will be over 4,000,000 boxes. This of course, has had a marked effect on the orange trade of the United States, and its influence is shown in the steady decrease in foreign oranges brought to our market. In 1887 there were imported 1,620,000 boxes and 127,000 cases of foreign oranges; in 1888 the total was 1,150,000 boxes and 154,000 cases; in 1889 it was 1,100,000 boxes and 180-000 cases.

BANANA FIBRE.—Attention is being again directed to the utilizing of the banana. From the stalk and leaf of this plant, it is stated, a beautiful silken fibre can be obtained, which, when manufactured into dress goods, closely resembles Irish poplin. When suitable machinery for decorticating it is found, it is thought this fibre will command large commercial attention for the manufacture of textile goods, as well as for paper and other purposes.

USES OF SAWDUST.—Sawdust is becoming a valuable commodity in the East, and in New York $5,000,000 annually represents the sale of that article. It is used for packing of all kinds, by plumbers for covering of pipes, for stuffing of dolls and deadening of floors, and for covering the same in hotels, shops and saloons. And last, and probably the greatest factor in its consumption, is its use to assist in the sweeping of floors.

NOCTURNAL ARTILLERY.—The big guns turned out by the English arsenals are now fitted up with a device to facilitate firing at night. The ordinary sights are illuminated by a small incandescent lamp, the rays from which, passing through a lens, are converged, so that only a minute point or line of sight, just sufficient to distinguish the sight, is obtained. By means of an adjustable resistance the light can be modulated to suit the degree of darkness of the night or the eye of the observer.

NEW LIFE-SAVING APPLIANCE.—An act has been passed in the English parliament under which every ship and steamer going to sea must be provided with sufficient boats, or with life-saving rafts, to accommodate every person on board, crew or passengers. A London firm has opportunely patented a raft which may be folded up so that it shall take up no more room upon a ship's deck than does an ordinary life-boat, and which may, in fact, be made a check for the reception of the life-boat, and both boat and raft by an ingenious, but really simple contrivance, may be put overboard by the same set of davits, and the raft follows the boat so quickly that the two are sent afloat within a couple of minutes of each other.

BUSINESS NOTES.

IMITATION GOLD.—An Englishman has invented a metal that can hardly be distinguished from gold. It is like the precious metal in all its best points, can be hammered and drawn equally well, and presents a good wearing surface. It is not a compound that gains its gold color from the action of a chemical. The inventor has placed samples of his discovery on the market and expects to begin its manufacture soon. It can be made for 60 cents a pound, and may be used extensively in the manufacture of cheap jewelry.

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CONTENTS.

CONGRESS AND ADULTERATION.

So much has been written and said about the importance of national interference with the adulteration evil that the readers of the AMERICAN ANALYST will doubtless be interested in learning precisely what legislation in the subject is pending before Congress. Through the courtesy of the Hon. Amos J. Cummings, Member of Congress from the ninth district of this State, we are in receipt of all the bills in regard to food adulteration that have been introduced during the fifty-first Congress, and we present herewith an abstract of their character and leading provisions. On December 18th last, Mr. Conger of Iowa introduced a bill "defining 'lard,' also imposing a tax upon and regulating the manufacture, sale, importation and exportation of compound lard." This bill defines lard "to mean the food product usually known as lard, and which is made exclusively from the fresh fat of slaughtered swine." Any imitation or substitute therefor is "compound lard," and the manufacturers of the latter are to pay to the Commissioner of Inland Revenue $100 license fee, while the dealers in the article are to be taxed from five to twenty-five dollars per annum, according to the extent of their sales. On the same date Mr. Butterworth of Ohio, introduced a bill "to regulate the manufacture and sale of counterfeit or compound lard." In this bill the compound article is designated "lardine," and the license fee for its manufacture is $500, while the dealers in it are to be taxed from $25 to $350 per annum. On February 18th, Mr. McClammy of North Carolina introduced a bill "defining 'lard;' also imposing a tax upon and regulating the manufacture, sale, importation, and exportation thereof." This bill goes further into details in its classification than those above referred to, and requires a license fee of $100 to manufacture and a tax of from $5 to $25 for dealing in lard of whatever denomination. Its provisions do not seem to have precisely suited its sponsor's constituents, for we find him just one week later, February 24th, introducing another bill identical with the one just described in title and general character, but with some slight alterations in the matter of penalties for violators of the law. We will discuss the particular merits of these four lard bills at greater length at an early date. In respect to general food adulteration two measures have been introduced in the House of Representatives, one on December 18th, by Mr. McComas of Maryland, and the other on February 11th, by Mr. Lehlbach of New Jersey. The first of them will be found in full in another portion of this issue. That fathered by Mr. Lehlbach we are compelled to defer until next week. In regard to Mr. McComas's measure it will be observed that many of its features compare closely with the provisions of one or two other bills that have been heretofore prepared ostensibly to the same end. The bill prepared by the National Food Commissioners Association at Cleveland last November was almost identical with this one excepting that the former provided for the establishment of a National Bureau of Adulteration, while the one now under consideration confers the management of the whole subject to the National Board of Health, an alteration that commends itself on the score of simplicity and economy of administration. The important feature of the Cleveland measure is practically retained which excludes from the category of adulteration, in the language of the new bill, "mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health and that the articles are distinctly labeled as a mixture, stating the components of the mixture." That passage is the keynote of the whole reform to be hoped for in the adoption of the McComas's bill, and it marks a step far in advance of the numerous schemes that have been projected upon Congress in past times by interested parties, whose special aim was concealment rather than publication of the ingredients of food compounds. There are many such compounds that are not only innocuous but preferable to the simple elements of which they are composed. If, however, the public are to be solicited to purchase compounds they should be notified of the fact, and be informed of the precise character of the goods placed before them. The manufacturers and dealers in such commodities would then at least be exonerated from all possible charge of imposition. The evil of adulteration, furthermore would be so far checked that its ultimate suppression would thenceforward devolve upon supplementary legislation by the several States for the enforcement of similar restrictive measures within their respective borders. The action of Congress in the premises is of course limited to the regulation of inter-state traffic, and to the transportation of food commodities into or from the Territories, or their importation from foreign countries. It is to be hoped the importance of the subject will be so earnestly impressed upon our national law-makers as to secure passage of the bill we have been briefly considering, or of some equally judicious measure during the term of the present Congress. It is needed peremptorily, and promptly.

HORSE FLESH FOR FOOD.

The working classes in London are reported to be much excited over the recent discovery there that the sausagemakers there have been selling horsemeat chopped up in sausages, and that this meat has been obtained from worn out horses, and therefore is tough and stringy. London sausage venders are called pork butchers, and some of these have felt compelled to put up placards in their shops guaranteeing that the sausages they sell are not made of horsemeat. The discovery that horsemeat is extensively sold in London was accidentally made. A man having bought two worn out omnibus horses was accused by the Society for the Prevention of Cruelty to Animals of buying disabled hacks and putting them to work. In his defense he proved that he bought them to slaughter. As there are over 25,000 work horses employed in London, an outlet more profitable than the skinners had to be found for those that were worn out, and the example of Germany readily pointed to the way. This meat being much cheaper than beef soon came into extensive use in the British metropolis, though not under its true name. Horsemeat cannot be passed off for beef because of its dark color and sweetish taste. It is of a reddish brown color varying according to the age of the animal to a dark brown in older horses, the muscles are smaller and thinner than in beef, it is more shiny and is not mixed with fatty tissue. When exposed to the air horsemeat becomes still darker and even black on the surface. The fat is of a brownish yellow shade and melts at a lower temperature than beef suet. The marrow in the bones is of a waxy color, soft and semi-liquid but hardens on exposure. The meat has the same sweetish taste as the beef of the cow. The use of horsemeat for food is allowed by law and carefully regulated in Germany. In Berlin about 10,000 horses are slaughtered for food every year and many people there never purchase any other kind of meat, because they cannot afford it. Those butchers who sell horsemeat are not allowed to sell any other kind of meat and must have the words *Ross-Schlachter* (Horse-Butcher) as a sign prominently affixed to their premises. Of course, though the police and sanitary inspection be ever so strict, there is nothing to prevent a

restaurant-keeper from using horsemeat in his ragouts and hashed meats, he cannot even if so disposed sell it for roast beef. All horses which are to be slaughtered for food are killed in one abbattoir which is kept under strict surveillance, and such horses are carefully inspected by a veterinary surgeon before being killed and the meat is again examined microscopically by competent men. The horses slaughtered are nearly all worn out work horses and cost from ten to twenty dollars each. The hide is used for tanning, the blood to make albumen, the hoofs and bones for glue and any condemned meat is fed to the animals at the Zoological Gardens. Let us hope that it will be many years before our American workingmen will be compelled by low wages to feed on horseflesh as the German workmen of Berlin are to-day and as the English workmen are likely to be; and when the conditions of the workman and labor in the United States and Europe are compared let us ask ourselves how we would like to be compelled to subsist on the flesh of worn out car horses before we do anything to cheapen American labor.

AN ARCHITECTS' DIRECTORY.

The Analyst Publishing Company has added another enterprise to its already extensive business. It is the publication of a carefully compiled Directory of all the Architects in the United States. The names and addresses of these are arranged according to States and post-offices and also alphabetically. This classification is for the benefit of those who wish to reach architects by circular or letter. The convenience of the architects is provided for by the compilation of a classified directory of the numerous manufacturers and dealers in articles which are used in the various branches of the building trades. Of course this is not the first time that such a work has been compiled, but it was believed that on the principle that anything worth doing at all was worth well doing, a correct and exhaustive directory of this kind would be useful and acceptable to many, and therefore in this undertaking the greatest care has been taken and no amount of labor spared to make it a reliable work. This has been fully appreciated by the business community who have liberally patronized the advertising pages and extensively subscribed for the work which is expected from the press this week.

Electric Alarm Clock.—Among the recent applications of electricity to household use, is an electric alarm clock which most effectually calls attention to the hour at which it is set. A small lamp also throws a light upon the face of the clock, when a button which is fixed by the side of the bed is pressed, so that the time can be ascertained without the necessity of getting out of bed and the consequent imperilling of that most inestimable boon, the morning nap.

A NATIONAL ADULTERATION LAW.

FULL TEXT OF A BILL INTRODUCED IN CONGRESS, DEC. 18, 1889, BY REPRESENTATIVE MCCOMAS.

To prevent the adulteration of food or drugs. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That no person or corporation shall knowingly transport, or cause to be transported, from the State, District, or Territory in which he resides or does business, into any other State or Territory, or from any foreign country, or other State or Territory into the State or Territory in which he resides or does business, for sale or barter, or to be offered for sale or barter, any article of food or drugs adulterated within the meaning of this act; and any person violating the above provision shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be fined not more than fifty dollars for each offense.

Sec. 2. That no person shall, within the District of Columbia or in any of the Territories, or in any fort, arsenal, dock yard, or reservation, or other place under the jurisdiction of the United States, manufacture, offer for sale, or sell any articles of food or drugs which is adulterated within the meaning of this act; and any person violating this provision shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine not exceeding fifty dollars.

Sec. 3. That if on examination of any article of food or drugs imported from any foreign country it is found to be adulterated within the meaning of this act, a return to that effect shall be made upon the invoice, and articles so noted shall not be permitted to pass the custom-house or be delivered to the consignees, unless on re-examination, as provided for in this act, it shall be found that the said articles are not adulterated.

Sec. 4. That the owner or consignee shall have the privilege of calling, at his own expense, for a re-examination; and on depositing with the collector of customs such sum as he may deem sufficient to defray such expense, it shall be the duty of the collector of customs to procure a certificate, under oath, from a public analyst, of a careful analysis of the articles in question; and in case the report by certificate of the analyst shall declare the report of the officer who examined the goods to be erroneous, and the said articles to be unadulterated, the said articles shall be returned to the owner or consignee, and passed without reservation on payment of the duties, if any; but in case the officer's return shall be sustained by the analyst, the said articles shall remain in charge of the collector of customs, to be disposed of in accordance with regulations to be prepared by the National Board of Health and approved by the Secretary of the Treasury:

Provided, That the owner or consignee, on payment of charges of storage and other expenses necessarily incurred by the United States, and on giving bond, with sureties satisfactory to the collector, agreeing to remove said articles from the United States, shall have the privilege of re-exporting them at any time within the period of six months after the date of the report of the inspector or public analyst.

Sec. 5. That in order to carry into effect the provisions of this act the Secretary of the Treasury is hereby authorized to appoint, from names submitted to him for that purpose by the National Board of Health, one or more suitably qualified persons as special inspectors and as public analysts for adulterated food and drugs at such ports of entry as the Secretary of the Treasury may deem expedient; and it shall be the duty of the National Board of Health to prepare instructions governing the work of such inspectors and analysts, which, when approved by the Secretary of the Treasury, shall govern their action, and that of collectors of customs, in preventing importation from foreign countries of food or drugs adulterated within the meaning of this act.

Sec. 6. That the National Board of Health shall make or cause to be made, examinations of specimens of food and drugs collected under its direction in various parts of the country, and shall publish in its weekly bulletin the results of such analyses. If it shall appear from such examination that any of the provisions of this act have been violated, the secretary of the Board shall at once report the facts to the proper United States district attorney, with a copy of the results of the analyses, duly authenticated by the analyst under oath.

Sec. 7. That it shall be the duty of every district attorney to whom the secretary of the National Board of Health or any collector of customs shall report any violation of this act to cause proper proceedings to be commenced and prosecuted without delay for the fines and penalties in such case provided, unless, upon inquiry and examination, he shall decide that such proceedings can not probably be sustained, in which case he shall report the facts to the National Board of Health. And for the expenses incurred and services rendered in all such cases the district attorney shall receive and be paid from the Treasury such sum as the Secretary of the Treasury shall deem just and reasonable, upon the certificate of the judge before whom such cases are tried or disposed of.

Sec. 8. That an article shall be deemed to be adulterated within the meaning of this act—

a. In the case of drugs:

First. If when sold under or by a name recognized in the United States Pharmacopœia it differs from the standard of strength, quality, or purity laid down therein.

Second. If when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity laid down in such work.

Third. If its strength or purity fall below the professed standard under which it is sold.

b. In the case of food or drink:

First. If any substance or substances has or have been mixed with it so as to reduce or lower or injuriously affect its quality or strength.

Second. If any inferior or cheaper substance or substances have been substituted wholly or in part for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted

Fourth. If it be an imitation of or be sold under the name of another article.

Fifth. If it consist wholly or in part of a diseased or decomposed, or putrid or rotten, animal or vegetable substance, whether manufactured or not, or, in the case of milk, if it is the product of a diseased animal.

Sixth. If it be colored or coated, or polished, or powdered, whereby damage is concealed, or it is made to appear better than it really is, or of greater value.

Seventh. If it contain any added poisonous ingredient, or any ingredient which may render such article injurious to the health of a person consuming it:

Provided, That the National Board of Health may, with the approval of the Secretary of the Treasury, from time to time declare certain articles or preparations to be exempt from the provisions of this act.

And provided further, That the provisions of this act shall not apply to mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health, and that the articles are distinctly labeled as a mixture, stating the components of the mixture.

Sec. 9. That it shall be the duty of the National Board of Health to prepare and publish from time to time lists of the articles, mixtures, or compounds declared to be exempt from the provisions of this act in accordance with the preceding section. The National Board of Health shall also, from time to time, fix the limits of variability permissible in any article of food, drug, or compound the standard of which is not established by any national pharmacopœia.

Sec. 10. That the term "food" as used in this act shall include every article used for food or drink by man. The term "drug" as used in this act shall include all medicines for internal or external use.

SEC. 11. That all the regulations and declarations of the National Board of Health made under this act from time to time, and promulgated, shall be printed in the Statutes at Large.

SEC. 12. That it shall be unlawful to import into the United States any adulterated or unwholesome food, or vinous, spirituous, or malt liquors adulterated or mixed with any poisonous or noxious chemical drug or other ingredient injurious to health. Any person who shall import into the United States any such adulterated food or drink, knowing or having reason to believe the same to be adulterated, being the agent, or the agent of the owner, or the consignor or consignee of the owner, or in privity with them, assisting in such unlawful act, shall be deemed guilty of a misdemeanor, and liable to prosecution therefor in the District Court of the United States for the district into which such property is imported; and on conviction such person shall be fined in a sum not exceeding one thousand dollars for each separate shipment, and may be imprisoned by the court for a term not exceeding one year, or both, at the discretion of the court.

SEC. 13. That any article designed for consumption as human food or drink, and any other article of the classes or description mentioned in this act, which shall be imported into the United States contrary to its provisions, shall be forfeited to the United States, and shall be proceeded against under the provisions of chapter eighteen of title thirteen of the Revised Statutes of the United States; and such imported property so declared forfeited may be destroyed or returned to the importer for exportation from the United States, after the payment of all costs and expenses, under such regulation as the Secretary of the Treasury may prescribe; and the Secretary of the Treasury may cause such imported articles to be inspected or examined in order to ascertain whether the same have been so unlawfully imported.

SEC. 14. That whenever the President is satisfied that there is good reason to believe that any importation is being made, or is about to be made, into the United States, from any foreign country, of any article used for human food or drink that is adulterated to an extent dangerous to the health or welfare of the people of the United States, or any of them, he may issue his proclamation suspending the importation of such article from such country for such period of time as he may think necessary to prevent such importation; and during said period it shall be unlawful to import into the United States from the countries designated in the proclamation of the President any of the articles the importation of which is so suspended.

SEC. 15. That this act shall take effect ninety days after it shall have become a law.

PUMICE STONE.

ITS CHIEF SUPPLY OBTAINED FROM AN ISLAND IN THE TYRRHENIAN SEA.

We often hear it remarked, and particularly after an eruption of a volcano, that pumice stone ought then to be plentiful and cheap, as quantities must have been ejected during the volcanic disturbance. As a matter of fact, however, none of the white stone in general use is obtained from active volcanoes. It is true that Vesuvius has ejected pumice stone, for at the time when Pompeii was destroyed large quantities fell over the doomed city, but that pumice appears to have been only of diminutive size, and is gray in color, and of the same inferior character as that found to the north of Naples. It is also probable that volcanoes situated in the Southern Seas emit pumice, for accounts are published now and again of vessels sailing through quantities stretching for miles upon the surface of the water. This, presumedly, is similar to that taken from the sea near the Italian shores. It is small in size, and in the form of pebbles, having been rounded by the action of the water. As already stated, we are not indebted to ejections from volcanoes for our supply of stone. It is to actual deposits of the article discovered in one or two quarters of the globe, the best of which is at present to be found in the island of Lipari, situated in the Tyrrhenian sea. The island is of no general interest, and is scarcely visited at all by any but Italians engaged in trading in its productions, such as currents, capers, wine and pumice. It is mountainous in character, and consists of tuffs and lavas, and of highly siliceous volcanic products. The district where the stone is found is called Campo Bianco or Monte Petalo (1,500 feet above the level of the sea.) It is an interesting ride there upwards from the town. The views obtained of land and sea during the ascent are very fine, and the effect produced by the first sight of the pumice deposit curious, for after riding a considerable distance, partly along precipitous paths, sufficiently dangerous to be interesting, and partly through vineyards and over grassy plains, one almost suddenly comes upon a seemingly snow-clad, narrow valley, enclosed by hills also quite white, and the whole glaringly bright on a sunny day, such as can be experienced in this latitude. Into these hills workmen are ceaselessly digging deep burrows, working within by candle light. In their excavations they come across many lumps of pumice stone, which are placed in baskets, etc., subsequently being conveyed along the valley to the sea-shore, where small boats are loaded and sailed to the seaport near by, where the stone is sorted, packed and shipped to distant parts either via Messina or Leghorn. Some years ago it was almost the general custom to send the stones loose in the vessels to the Leghorn merchants, who sorted and packed it for shipment. This custom, however, has been altered, and by getting the stone sorted at the place of production far better results have been obtained than formerly. There is no doubt but there is now less good stone to be found than used to be the case. For one ton of good light stone a miner has to have many tons of inferior quality to dispose of, and now that prices have been so interfered with by the operations of the syndicate that it has been formed to acquire the working of the principal portion of the mines from the municipality, it has become a question of paying a very high price for stone we could formerly obtain for far less than it now costs.—*British and Colonial Druggist.*

SHOES AND OIL.

WHAT IS THE BEST KIND OF OIL FOR PRESERVING LEATHER?

Animal oils and greases incorporate themselves with the fibre; they do not evaporate. Their action is like that of compounding various metals—instead of forming a composition, in the one case, all the elements are so compounded that their individuality is lost, and separation is almost impossible; in the other, the elements are mixed, but can be separated almost without loss in bulk. Moisture will drive the grease to the surface, and gradually the interior will be robbed of its life, but there is no evaporation. Consequently the leather retains its flexibility much longer than when the grease is also drawn out by heat and the action of the air. Animal oil does not penetrate the leather so quickly as oils that are more volatile, but this very quality is what makes them more valuable, as they are taken up by the fibre, not simply sucked in and filling around it, and they are equally difficult to draw out. Rancid oils, oils that have undergone a chemical change that marks the first step toward vitiation, have lost their most valuable properties, and the process of decay which has begun introduces gases, creating the volatile element which so quickly robs the leather of its nourishment. At the same time the fibre is injured by the decaying grease. Vegetable oils rank next to animal in their preservative qualities, but the oils extracted from flax seed and cotton seed, unless purified, are of such gummy nature and so easily affected by heat that they are unfit for use by the currier. Cotton seed oil, purified as it is when sold for sweet oil, is an excellent but an expensive oil for leather. Pure olive and castor oil possess the qualities requisite for preserving leather and keeping it soft, but their cost precludes their general use. Castor oil is the best, and for re-oiling it is not surpassed by animal oils. Fish oil is used more than any other, and to its use may be attributed much of the poor wearing qualities of the leather now in the market. By an improved process of manufacture, fish oils are deodorized so thoroughly that their presence cannot be detected. They penetrate more readily than either animal or vegetable oils, but they do not incorporate themselves with the fibre. They simply fill up the interstices, and, being of a light nature, they are easily drawn out by heat or moisture. They impart a soft condition to the leather when it is new, as much so if not more than do the animal oils, and because of that, they are not condemned. If used freely in connection with hard grease, they become rancid, and impart an odor which is retained as long as there is any grease in the leather. Mineral oils are being introduced quite freely, and as they are thoroughly deodorized, they find ready purchasers. These oils are the worst possible that can be put into leather. They have wonderful penetrating properties, but they are heating, and their volatile properties deprive them of the permanency so necessary for the preservation of the leather. They do not take kindly to other oils or greases, and are easily cut by water. While the natural heat from the feet will cause evaporation, particularly if the leather is moist, they do not become rancid, but they are more injurious to the fibre than even the most rancid animal oil. The shoe manufacturer should condemn all leather treated with mineral oils. A little care on his part will enable him to determine the oil used, whether animal, vegetable or mineral. Good grain and clear fleshed stock invite the eye, and if properly treated with oils the leather will prove acceptable, but grease is the life of the leather, and just in proportion as the grease is pure and incorporates itself with the fibre is the leather durable or otherwise.—"*Boots and Shoes*" *Weekly.*

PORTABLE TELEPHONES.—There are some people who make queer disposals of their telephones. A well-known undertaker of this city, has his telephone on a dumb-waiter. He runs it up to his room at night and can answer it without getting up. In the daytime he runs it up out of sight after he has used it, and when the people who are always wanting to "use your telephone for a moment," drop in for that purpose he tells them they can use it if they can find it.

ASTONISHING FORCE.—Some idea of the power exerted by sea waves may be formed from the following facts: An iron column, twenty-three feet long and weighing 6,000 pounds—parts of a lighthouse being built—was in course of operation, landed at Bishop Rock, England, and, a storm coming up, was left lashed by a chain at each end to two strong eye-bolts. Three days after, when the storm had abated, it was found that the great column had been moved a distance of twenty feet and landed on top of a projecting rock. A blacksmith's anvil, weighing nearly 200 pounds, and sunk in a pit three and one-half feet deep, had been washed entirely out of the sink and landed near the column of iron above mentioned. It had been floated nearly 200 feet after being lifted out of the hole.

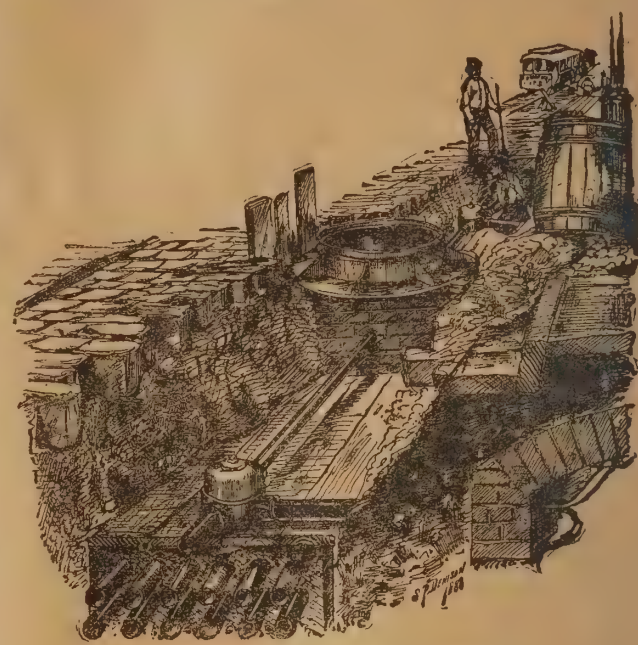
PARALYZING.—"That's a right smart gal of yours," said a benevolent-looking old gentleman on a Western railroad train to a lady sitting in front of him. "I've been watching her for some time." "Yes, I have noticed you," remarked the lady; "you have children of your own, perhaps; but I dare say, yours are all grown." 'No'm; I've some growed up, but I've got a little tot to home only eight months old, and another a year old, and one fo'teen months and one two years old, and a pair o' real cunnin' twins two years and a half old, and a boy three and a girl the same age. Then there's Mary an' Arvilly, an' Jonas, an' William Henry, an' Peter, an' Salviny, an' Antoonetty, an' Victoriay, an' Charles Summer, an' Angeliny, an' Cyprus, an' Naomy, an' Ruth, and Diany, an'——I have to git off at this station to take the Salt Lake train. If you should ever be in Utah come an' see the children. There's some I ain't named—good-bye!"

NEW YORK SUBWAYS.

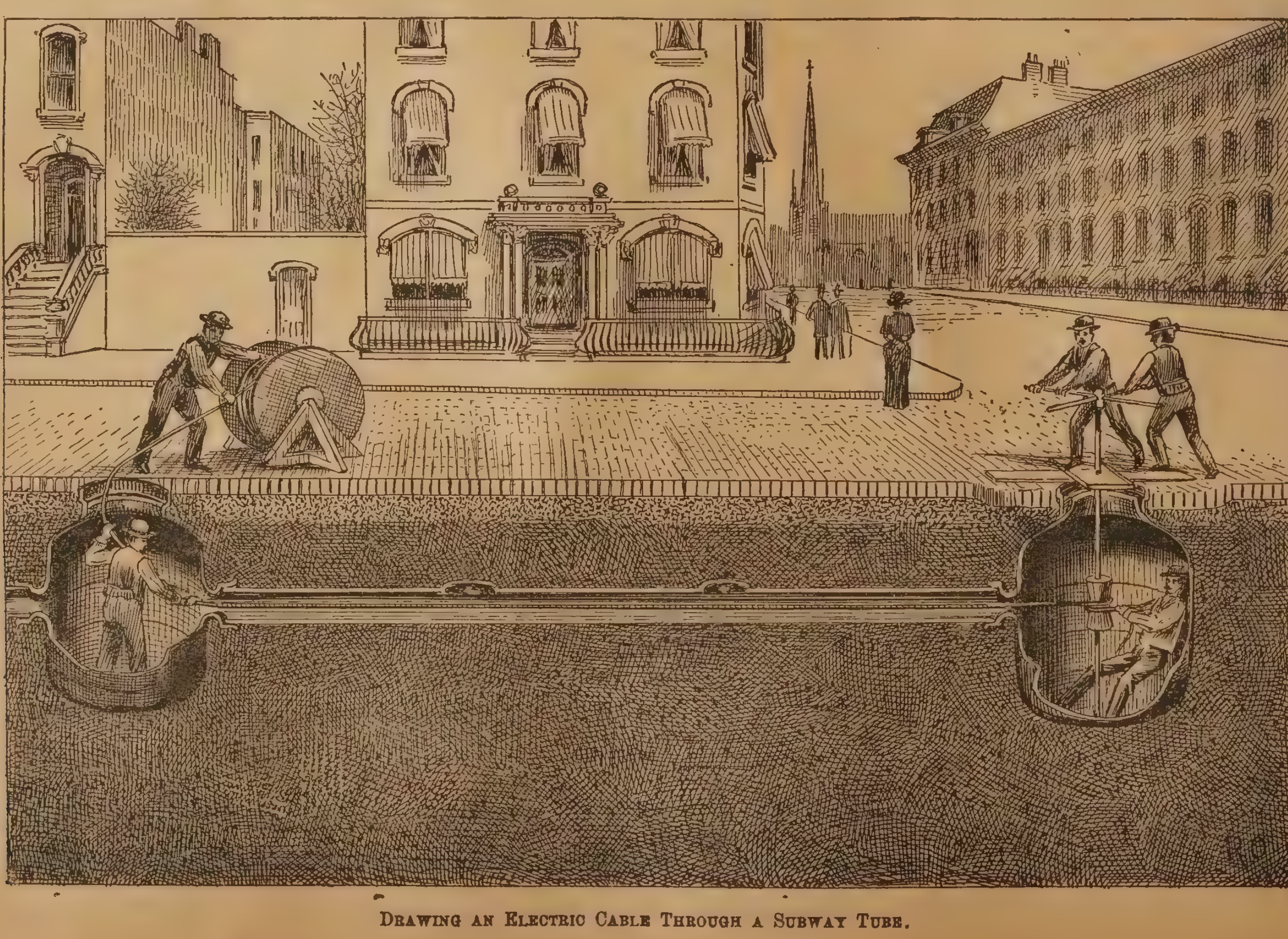
HOW THE ELECTRICAL CURRENT IS CARRIED THROUGH THE CITY UNDERGROUND.

With all the discussion that has been published in the newspapers respecting the electrical subways in this city, and despite the frequent and prolonged inconvenience the patient public has experienced through the tearing up of the streets for their reception, it is doubtful whether one person in a thousand has any well-defined notion of their construction or of the manner in which they are operated. We see the unsightly forest of telegraph poles that so long obstructed our sidewalks gradually disappearing, and have a dim consciousness that henceforward the wires are to be conducted beneath the pavements. But how their mystical communication—pulsing with unuttered language, and pregnant with invisible lightning—is maintained, ceases to interest the most of us as soon as they have passed out of sight. Even the occasional explosion of a "manhole," which disconcerts the pedestrian on Broadway or the Sixth avenue by unexpectedly raising him to the height of the second story windows in a sudden blast of cobble-stones and mud, is genially accepted as an illustration of the elevating tendency of scientific progress, and the subject is promptly dropped. So far as we have heard no person who has made such an ascent has ever displayed an immediate curiosity to examine the adjustment of the subterranean mechanism to which he was indebted for his precipitation into space. This apparent indifference to his environment, however, is a recognized characteristic of the average New Yorker who learns from childhood to be always on the look-out for the unexpected, and to whom the incomprehensible, whether typified by the doings of policemen, or messenger boys, or juries, or blizzards, appears the most natural thing imaginable. For the benefit of the readers of the AMERICAN ANALYST, who prefer to keep acquainted with what is going on about them we present herewith an abstract of a paper describing the practical working of the electrical subways in New York City read by Mr. Maver, Jr., at a recent meeting of the American Institute of Electrical Engineers. The paper was published in the *Electrical Review* of March 1st together with the accompanying illustrations, the use of which has been kindly permitted us by the editors of that valuable journal:

"After a few preparatory remarks, the lecturer stated that, in New York City to-day, there are 73 miles of electrical subways and 1,017 miles of ducts. In these ducts are 10,906 miles of telephone wire, 945 miles of telegraph wire, including fire alarm telegraph wires, and 457 miles of electric light wires. These subways have a capacity for about 45,000 miles of telephone and telegraph wires, and 2,000 miles of electric light wires. In the New York subways there are eight different conduit systems, namely, the Dorsett, the Wyckoff, zinc tubing in hydraulic cement, sheet iron cement lined pipe, wrought iron pipe in hydraulic cement, wrought iron pipe in asphaltic concrete, the Edison iron tube and the Johnstone sectional cast iron conduits. The descriptions of these conduits are familiar to our readers. Access is had to the conduits by means of manholes placed at an average distance of 1¼ miles apart. The manholes are, with few exceptions, built of brick laid in concrete cement, and coated on the outside with cement. In most of the systems the cable is inserted by a process technically called "rodding," that is, pushing rods through the duct from one manhole to the next. A rope is attached to the rod and the cable to the rope. The cable is then drawn in by means of some form of winch. Various systems of distribution from the main trunk line cables have been used, the Johnstone system being probably the most largely employed. Our illustration gives a good idea of this conduit. This system has been found of much utility in the practical distribution of electric light current in this city. In the telephone service the cables used are chiefly of the type known as the Patterson, having an electro-static capacity of about .16 microfarad, and an insulation of resistance averaging about 100 megohms, as the cable is used in the subways. The longest stretch of telephone cable is seven miles, and the greatest number of conductors in any one cable is 100 or 50 pairs. The telegraph companies have thus far used chiefly for underground service okonite, standard underground, kerite and Patterson cables. The average number of conductors in the telegraph underground cables is about 50; the size of the wire used is, as a rule, No. 16, B. W. G., and the outside diameter of a

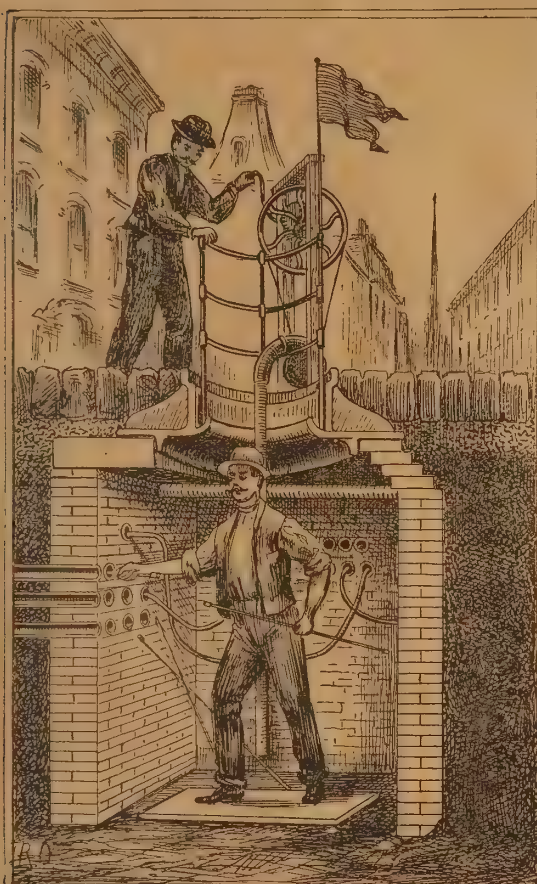


A FINISHED SUBWAY BEFORE COVERING.



DRAWING AN ELECTRIC CABLE THROUGH A SUBWAY TUBE.

conductor, including the insulation, is $\frac{6}{32}$. In the electric light service, there are, exclusive of the Edison system, four different types of insulation used, namely, the Bishop rubber compound, the standard underground, the safety insulated, and the Cobb vulcanite paraffine cable. The present condition of the majority of these cables, which have been down from one to three years, is very satisfactory. The methods employed for locating faults in electric light conductors in the subways, is to test the conductor from point to point, until the defect is placed between two lamps or



VENTILATING A SUBWAY.

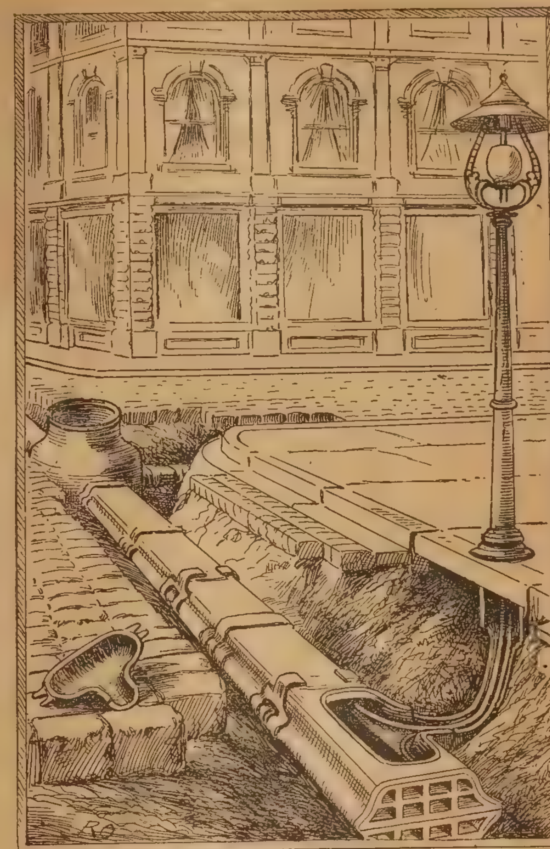
manholes. If the defect is in the cable proper, the section is withdrawn, and a new section substituted. With the Edison conductors, access is had at the ends of each pipe by removing the paving and earth about the pipe. The Dillon joint, and the Cobb joint, have been suggested for use, as they render the ends of the cable accessible. Concerning the durability of cables, the lecturer did not think that sufficient time had elapsed, so that a definite judgment could be formed. Specimens of cable which have been in service for nine or twelve months, show no physical or electrical deterioration. It would appear that lead-covered cable is preferable for underground use. There are no concentric cables in the subways in this city. The mains of multiple arc circuits are operated in separate lead covers in the same duct. It is contemplated by one of the companies to use one lead cover for such circuits hereafter. Mr. Maver dwelt at some length upon the importance of making good joints, and urged the necessity of employing efficient men to do this work. The use of a lead covering on the cables is not required by the subway rules, but for many reasons the companies have adopted it of their own accord. It will hardly be credited by some people, but it is a fact, that live electric light wires conveying the alternating high tension arc currents, are handled and moved about in the manholes by means of the lead covering, without the slightest indication that such wires are alive. The high tension circuits are tested weekly with a Thomson reflecting galvanometer, and, as a rule, 100 volts chloride of silver battery is employed as a testing battery. The subject of testing the underground cables was treated in considerable detail. On some of the circuits a lightning arrester is used, known as the Acheson cable protector. These are intended to protect the cable against disruptive discharges from any source. As regards the accidents to workmen in the manholes, due to contact with live wires, no one will say that such occurrences are impossible, but inasmuch as not a single accident of this kind has occurred in New York City, or, so far as I can learn, elsewhere in electrical subways, it is fair to assume that with the exercise of proper supervision of the wires this is not likely to prove a frequent source of accident. Whatever may be the dangers, stated and unstated, so freely predicted as liable to occur with the wires underground, it may be certainly said that men will not be injured by falling off poles in the subways. Wires, when in the subways, during the prevalence of sleet storms, will not fall upon people or horses in the street, nor be torn down by elevated trains, street cars, etc., etc. In my opinion, the presence of gas is the most serious defect of the electrical subways in cities; of course, it is not an inherent defect in the subways, but it is nevertheless a very troublesome one—not only because of the danger of explosions therefrom, but also because of its ill effects upon the workmen employed in the subways. It is actually admitted by the gas companies that this gas emanates from their mains in the street. The most successful method of overcoming this difficulty thus far has been to station blowers at intervals along the line of the subways and artificially ventilate them. The explosions of manholes in this city were shown, in nearly every case, to have been due to other than electrical causes. In conclusion, I think it may be said that the experience derived from the practical operation of the electrical subways of New York City has either made apparent, or confirmed among other things, the following:

That it is possible to successfully operate all classes of electric conductors underground in cities.

That at least for conductors conveying high tension currents underground, it is advisable to set the standardof insulation high. That regular insulation tests of the conductors are very valuable.

That liberal thickness of insulation is desirable for high tension currents.

That it is unadvisable to place underground new types of cable or insulation until they have been subjected to

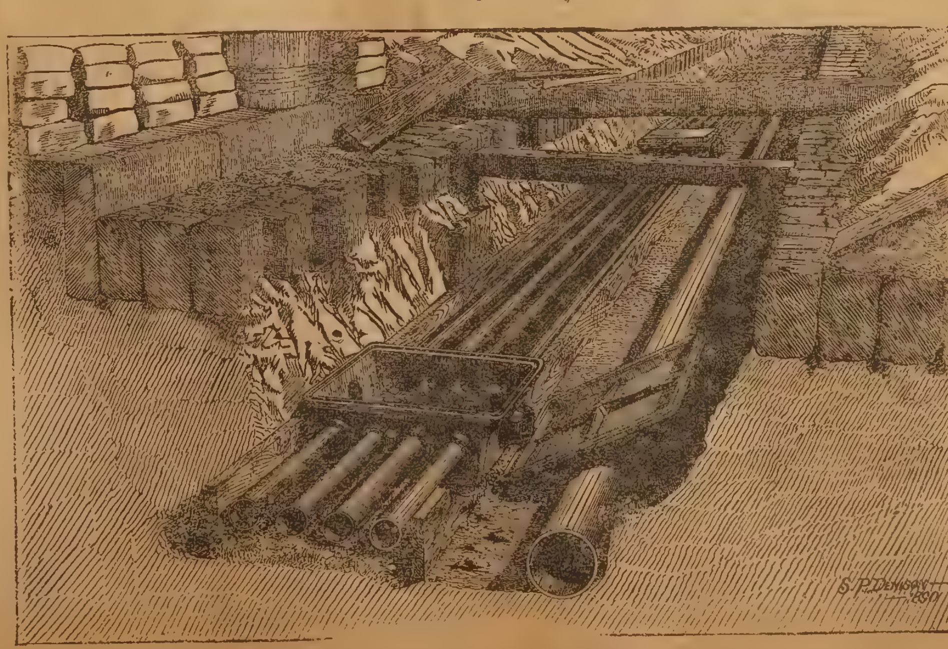


METHOD OF SUBSIDIARY DISTRIBUTION FOR STREET LIGHTING.

tests and conditions analogous to those to which they will be subjected underground.

That for electric lighting conductors—especially distributing mains—many conductors under one cover are not advisable owing chiefly to the difficulty in making joints in such cables. That all sharp edges in ducts should be avoided. That until the gas light companies are required, like the electric light companies, to maintain their mains in a fairly sound condition underground, a means of ventilating the subways should be provided simultaneously with the construction of the subways.

And, lastly, that while other features may be accessories thereto, the employment of smooth, strong conduits, accessible ducts for distribution of the current, first-class insulation, constant expert attention to details, and thorough organization in every department, are essential to the production of a successful electrical underground system."



SUBWAY PIPES IN POSITION.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

March.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, veal.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Bass, cod, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, [mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish, trout.

VEGETABLES.—Artichokes, beans, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress.

FRUITS.—Apples, bananas, oranges.

PRACTICAL RECIPES.

VEGETABLE SOUP.—Put half a pound of butter over the fire in a soup pot; when it is melted, add to it four heads of celery, two dozen sprigs of spinach, five sliced onions, four turnips cut into pieces, parsley and sweet herbs. Simmer for three-quarters of an hour, then add five pints of water; stew for half an hour; season and serve with dice of toasted bread.

FIXED-OVER FISH. — Melt two ounces of butter in a stew-pan, and dredge into it enough flour to thicken; add half a pound of cold fish that has been carefully flaked or pulled to pieces; let it cook a few minutes; add an ounce of cold butter, a dessert-spoonful each of anchovy sauce and mixed mustard, a teacupful of cream, sufficient pepper and salt and a few bread crumbs. Let it cook for a few moments, and serve, or pour it into a buttered dish, sprinkle with crumbs, and brown in the oven.

ITALIAN CHEESE. — Boil a knuckle of veal in two quarts of water until thoroughly done. Take the meat from the liquor and bone it; strain the liquor and remove every particle of fat when it gets cold. Cut the meat into small pieces and put it to boil again in the strained liquor. Tie up in a piece of net three cloves, a teaspoonful of whole allspice, half an ounce of whole pepper, and put with meat, adding salt to taste. When sufficiently boiled to make a jelly, line a mold with hard-boiled eggs; cut into slices, and pour the jelly in. When cold, turn out, and serve for tea or luncheon.

JUMBLES.—Sift a pound of powdered sugar and beat it to a cream, with a pound of butter; flavor with juice and grated rind of a fresh lemon or two tablespoonfuls of brandy and grated nutmeg; add four well beaten eggs and a pound of sifted flour, to which has been put a teaspoonful and a half of Horsford's baking powder. Form the soft dough into strips with the hand, twist them into rings, and bake on buttered tins in a moderate oven. These cakes will be quite rich.

CRANBERRY ROLL.—Stew a quart of cranberries in just enough water to keep them from burning; sweeten, strain and cool. Make a paste as for dumplings, and spread the cold cranberries over it about an inch thick; roll it, tie in a close flannel bag, and boil two hours. Serve with hard or soft sauce.

PRESERVED CITRON. — Prepare the rind; cut into pieces about an inch square; put it into tolerably strong alum water and boil very hard thirty or forty minutes; take from the alum water and put into clear cold water, and let stand over night; in the morning change the water and put to boil until the fruit has changed color and is quite soft. Strain out the pieces, and make a syrup, allowing a pound and a half of sugar to each pound of fruit; add the fruit which needs very little more cooking. Mace, ginger or lemon flavors nicely.

MUFFINS.—Mix smoothly a quart of wheat flour, a pint and a half of lukewarm milk, half a cup of yeast, two beaten eggs, a good teaspoonful of salt and two tablespoonfuls of lukewarm melted butter. Let the batter rise in a warm place, and when light bake in buttered muffin rings.

WHITE LEAD.

THE ADULTERATION AND FRAUDS IN SO-CALLED WHITE LEAD PAINTS.

An anonymous pamphlet has been issued in which a list is given of certain manufacturers and their brands of white lead which are said to be strictly pure. No evidence whatever is offered to show that this is the case. Appended to this are a series of analyses from different chemists throughout the United States, some of them well known, but many never heard of before, claiming to show very extensive adulteration of these white leads. Of course, this also includes many of the paste paints and ready mixed paints. It may be added that white lead is the carbonate of lead, manufactured from metallic lead by a process called corrosion. Barytes, the most common adulterant, is a heavy metallic substance, nearly worthless as a paint. As its cost is only about a cent a pound, it is very profitably introduced in paint.

ANALYSES OF WHITE LEADS.

Sample No.	Barium Sulphate.	White Lead.	Zinc White.	REMARKS.
1	52.30	40.60	7.10	Marked "strictly pure."
2	86.57	None.	13.06	Marked "pure guaranteed."
3	75.08	None.	13.96	Contains sulphate of lead.
4	44.23	46.17	9.84	Marked "pure guaranteed."
5	72.90	8.30	18.70	Marked "pure guaranteed."
6	60.20	Trace.	39.80	Marked "pure guaranteed."
7	53.40	2.22	45.10	
8	40.50	None.	59.50	Marked "English white lead."
9	63.75	1.24	29.38	
10	50.46	None.	48.67	Marked "$100 reward if not pure."
11	44.30	None.	55.70	Marked "pure."
12	54.85	2.73	42.42	Marked "pure."
13	80.23	None.	18.91	Marked "pure lead."
14	54.70	None.	5.	Marked "best and purest."
15	73.	None.	27.	Marked "purest and best."
16	57.53	....	40.95	Marked "pure."

To show the object of the fraud, the cost of one of the adulterated articles to manufacture is $1.63 per 100 pounds, while the white lead it purports to be is $5.60, a profit of 244 per cent. over and above the profit of the honest manufacturer. To buy such white lead is not only being robbed of money, but a loss of time in using it and an injury to the building or work upon which it is used. Much more can be said on the subject, and the public should be well informed.

SCROFULA.

Scrofula or struma was formerly known in England as "kings evil," from the belief that the touch of the sovereign could effect a cure. (This superstition can be traced back to the time of Edward the Confessor, in England, and to a much earlier period in France. Samuel Johnson was touched by Queen Anna in 1712, and the same prerogative of royalty was exercised by Prince Charles Edward, in 1745.) The disease is the result of a morbid constitutional condition generally exhibiting itself in early life, and characterized mainly by defective nutrition of the tissues and by a tendency to inflammatory affections of a low type with degenerative changes in their products. Scrofula may be either inherited or acquired. Hereditary is of all causes the most potent, and naturally with greater certainty when both parents possess the taint. As in all hereditary diseases, however, the liability may be scarcely perceptible for one or two generations, but may then reappear. Other causes referable to parentage may readily produce this constitutional state in children, as weakness or ill health in one or both parents, and, as seems probable, marriages of consanguinity. But apart altogether from hereditary or congenital influences, the scrofulous habit is frequently developed, especially in the young, by such unfavorable hygienic conditions as result from overcrowded, cold, and dark dwellings insufficient and improper food, exposure and debauchery. Even among the old in such circumstances the evidences of scrofula may be seen to present themselves where before they had been absent. There are two well marked types of the scrofulous constitution to be often observed, especially among the young. In the one the chief features are a fair complexion with delicate thin skin, blue eyes, dilated pupils, long eye-lashes, soft muscles, and activity of the circulatory and nervous system; while in the other the skin is dark, the features heavy, the figure stunted, and all the functions, physical and mental inactive. In many instances, however, it will be found that both types are more or less mixed together in one individual. The manifestations of scrofula generally appear in early life, and are often exhibited in young children during the first dentition by inflammatory skin eruptions of obstinate character on the face and other parts; later on in youth there appear glandular swellings either externally, as on the neck, or affecting the gland structures of the chest or abdomen, while at the same time mucous membranes and bones may become implicated. The distinctive features of the scrofulous inflammatory affections are their tendency to chronicity and to suppurative and degenerative changes, the affected parts either healing slowly with resulting disfigurement, as on the neck, and continuing to retain traces of the products of the diseased action, which may set up serious disturbances of the health at some future time. Further the scrofulous constitution always influences the duration and progress of any disease from which the individual may suffer, as well as its results. Thus in pneumonia, to which the scrofulous would seem to be specially liable, the products of the inflammation are not readily absorbed as in previously healthy persons, but, remaining in the lung tissues, are apt to undergo caseous degenerative changes, which may issue in phthisis. Scrofula may under favorable circumstances tend to improvement as age advances, and it occasionally happens that persons who in early life showed unmistakable evidences of this condition appear ultimately to outgrow it, and become in all respects healthy and vigorous. The treatment is partly preventive and partly curative. It consists mainly in hygienic measures to promote the health and nutrition of the young, and of suitable diet, tonics, etc., where evidences of the disease have declared themselves. To thoroughly eradicate the scrofulous taint from the system, an alterative is indispensable, and long experience has demonstrated that the safest and most effective medicine of this class is Ayer's Sarsaparilla, prepared by Dr. C. J. Ayer & Co., Lowell, Mass. So successful has been this remedy that it is now generally conceded to be *the* specific, *par excellence*, for Scrofula and all diseases originating in scrofulous diathesis.

VEGETARIAN ORGIES.—"Innocent Child: Mamma, where's our turkey? Don't we keep thanksgiving, like other people?" Mamma (advanced thinker and dietetic reformer): "Dio Lewis Fowler Wells Graham Jones, you ungrateful boy, you shock me! Eat your good oatmeal and your delicious gruel, and drink your pure cold water and be thankful, or I'll spank you!"

Subscriptions $1 per year. Now is the time to subscribe.

PHOTOGRAPHING THE BOTTOM OF A WELL.—An experiment was made in photographing the bottom of an oil well last week at Warren. The instrument was let down a distance of 1,700 feet. The moment it touched the bottom a bright flash lit up the cavity, and a perfect picture of the hole was impressed on the negative. It revealed as the effect of the explosive shock a cavity of fourteen feet broad and seven feet below sand. Rock, sand, pebbles and minute objects were distinctly revealed upon the plate. This device is likely to prove of the greatest benefit to science.

SEAMLESS STEEL BOATS.—Hydraulic power is now being applied to the manufacture of seamless steel boats. These boats are claimed to be proof against the destructive influences of sun and shower and to be much more durable and reliable than the ordinary wooden boats. Though made of steel, the weight will not be greater than that of a wooden boat of the same size, and the buoyancy will consequently be not less. It is contended that in every respect the seamless steel boat will be superior to the wooden one, and the cost of the one will not be materially greater than that of the other.

BIG CONTRACT.—One of the largest contracts for furnishing paper for the use of the census office is the one for manilla tabulating cards. The number of cards that will be used is estimated to be 100,000,000, and it is said that it will require 260 tons of manilla paper to furnish these cards. Under a former contract 20,000,000 sheet for the population schedule will be furnished, which is said to be the largest single order for writing paper ever given. No single mill in this country could meet the demand and the order is now being filled by two of the largest paper mills in the country. Already orders have been sent out for 14,600 reams of paper, which will weigh 584,000 pounds, and at the contract price, 9 cents per pound, will cost $52,560.

AERIAL FOUNDATIONS.—Among the remarkable examples of bold engineering in the great sugar refinery of Claus Spreckels, at Philadelphia, Pa., one of the most unique is the hanging or aerial steam engine foundations. The engines used in this establishment are distributed practically all over the buildings, a large proportion of them being on upper floors. Some of these engines are bolted to iron beams or girders on second and third stories of the building, and are consequently innocent of all foundation. Some of these engines ran noiselessly and satisfactorily, while others produced more or less vibration and rattle. To correct the latter, the engineers simply suspended foundations from the bottoms of the engines, so that, in looking at them from the lower floors, they were literally hanging in the air. A foundation does service to an engine, or any machinery, it seems, by its weight alone; hence, it makes little difference whether the foundation be firmly embedded in mother earth or in the air.—*Electrical Review.*

WOMEN COLLEGIANS.—In the list of the January matriculation examination at the London University just issued the noticeable fact is the small proportion of women who have been successful. Out of 175 women who were candidates the names of 47 appear in the list, as compared with 80 last year out of a slightly smaller number of candidates. Another remarkable feature in the list is the smallness of the total number of candidates who go out with honors. In January, 1889, there were but 47. Now, however, the number has fallen to 19. The failures generally are exceptional, though most marked in the case of the women candidates.

CREMATION IN EUROPE.—At the Woking (England) crematory, the number of cremations is steadily increasing. In three years, from 1884 to 1887, the annual average was eight. In 1888 there were 26. In 1889 the number increased to 46, the total number at the end of the year having been exactly 100. This year there have been several every week. In France, at the new crematory in Paris, there were 35 ordinary cremations in 1889, but the number of still-born children and the bodies from the hospitals and anatomical schools is so large that incineration is continually going on both night and day. The *Journal d'Hygiene* says that the total number was nearly 3,000 in the year. At Rome the numbers were 119 in 1886, 155 in 1887, and 202 in 1888. At Milan and other Italian towns the numbers are increasing, as also in Germany.

NO IRISH NEED APPLY.—Paris public schools are overcrowded, and the authorities propose to help to remedy the difficulty by forbidding the attendance at them of children of foreigners. There are 60,000 foreign children in the city, and at least 5,000 of them are getting a French education free at the public schools.

FRENCH COAL.—The French output of coal last year was 24,588,880 tons, 1,985,986 tons more than in 1888, and 3,300,000 tons more than in 1887. The increase would have been still larger but for strikes among the miners in the largest district. The French are making a greater effort to take from English miners the Mediterranean trade.

AMERICAN ANALYST CLUB RATES.

	Regular Price.	Price including American Analyst.
American Rural Home	$1 00	$1 50
American Agriculturist	1 50	1 60
Art Amateur	3 50	4 00
Arthur's Home Magazine	1 50	2 00
Art Interchange	3 00	3 25
Babyhood	1 50	1 60
Ballou's Magazine	1 50	1 75
Cassell's Family Magazine	1 50	1 75
Century	4 00	4 25
Christian Herald, N. Y	1 50	1 50
Christian Union,	3 00	3 10
Cosmopolitan, N. Y	2 40	2 50
Cottage Hearth	1 50	1 50
Country Gentleman	2 50	2 50
Current Literature	3 00	3 00
Demorest's Magazine	2 00	2 10
Family Story Paper	3 00	3 00
Farm and Fireside	50	1 00
Fireside Companion	3 00	3 00
Forum	5 00	5 00
Frank Leslie's Illustrated Newspaper	4 00	4 00
Frank Leslie's Popular Monthly	3 00	3 00
Godey's Lady's Book	2 00	2 25
Golden Days	3 00	3 00
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CONTENTS.

CONGRESS AND ADULTERATION.

The vigorous anti-adulteration measures which are under consideration in Congress call attention to a point of considerable importance in relation to the methods that have been proposed for their respective enforcement in case they or any of them should become law. The "compound lard" bills, explained in another column, will be found to all provide for the imposition of a special tax on that commodity as well as for its inspection, with a view to crippling the cottonseed oil interest in favor of the vile grease article, which unquestionably constitutes a noticeable proportion of the so-called "genuine lard" now manufactured. Of the four bills relating to this commodity, the one introduced by Mr. Conger is understood to be most favorably regarded by the House Committee on Agriculture which has it in charge. It is strongly backed by the farming interest, and the "Grangers" constitute an element of voting power that the politicians in Congress are eager to conciliate. If it were practicable that element would be seeking separate protection through this special tax system for each of the numerous articles of farm produce which it is possible to replace with cheaper and more desirable substitutes. The oleomargarine movement was so successful that the agricultural mind is keenly on the alert for other schemes of like profitable character at the expense of the consumer. It is a somewhat interesting circumstance that the special tax method of bolstering up special class legislation, embodying as it does many of the most objectionable features that attached to the tax laws of the rebellion period, should have for its most earnest advocate so prominent a democrat as Mr. Hatch of Missouri. This gentleman who is the leading democratic member of the House Committee on Agriculture expresses the belief that the use of the taxing power is the only constitutional means by which Congress can reach food adulteration. The imposition of a small tax for Federal purposes gives the Government the right to inspect and brand the article taxed. Nevertheless, while the courts would undoubtedly refuse to attribute to Congress a motive which did not appear upon the face of an enactment, and would doubtless sustain the constitutionality of any tax law, this method of accomplishing a purpose beyond the raising of revenue would be open on general principles to serious objection. Senator Paddock of Nebraska suggests a method for reaching the matter which it is claimed has the advantage of being more direct and at the same time within the line drawn by the Constitution. He proposes to have properly inspected all food products which are the subject of inter-state commerce, under the power vested in Congress to "regulate commerce with foreign nations, and among the several States." If all products which were exported from State to State were subject to inspection by Federal officials, those products could hardly fail to become the standards within the States as well as for purposes of export. The trouble is, as we said in the outset, with regard to the enforcement of such a law, for the serious question is at once presented whether greater harm than good would not be done by such a system of interference with private enterprise, and by the inevitable creation of a horde of federal officials empowered to enter the shops and factories of every citizen. We understand that the subject of general legislation in this matter of opposing adulteration is now enjoying the attention of a sub-committee of the House Agricultural Committee, and they are taking the opinion of eminent lawyers on the constitutional questions it involves, besides considering its economical aspects.

CONNECTING THE CONTINENTS.

The Pan-American Congress in Washington is still industriously engaged in formulating, through its several committees, the details of arrangements for promoting the reciprocal interests of the commercial communities of North and South America. Several reports are completed and rendered weekly. The most important one thus far handed in is that of the committee on railroads. Others that have been received relate to international law, patents, and trade marks, weights and measures, sanitary regulations, and extradition, while among those that are awaited with interest, are the reports upon customs union, port dues and banking. An impression which, we observe has gained some currency, that the congress is invested with some sort of legislative authority leads to the mistaken belief that the adoption of a report is equivalent to an international agreement. This is not so, but the good effects of bringing the delegates together are already apparent, and enlarged trade relations are certain to follow. As above remarked, the most important report thus far published is that of the committee on railroads, the leading point of which is that it assumes the possibility of an international line connecting North and South America. In furtherance of this end, the committee recommends the appointment of an international commission to study routes, etc., provides for free materials to be used in the construction and operation of the road, assures freedom of traffic by a declaration that the line is to be forever neutral, and recommends subsides by the various Governments to aid in developing the work. Practical railroad capitalists in the United States are already taking hold of the subject. The committee on steamship communication has made a general recommendation looking towards subsidies for a while at least. The committee on sanitary regulations has resolved against the closing of ports and frontiers in the time of epidemics. The committee on international law recommends a copyright treaty, one of the provisions of which is that the author shall enjoy in the contracting states the rights accorded him by the law of the state in which the original publication or production takes place. A trade-mark treaty based on the same principle is recommended. If the recommendations of the congress are adopted by the different Governments a United States trade-mark would be valid in Chili, for instance. English and German firms do an immense business in Central and South America under counterfeit United States trade marks.

LARD LEGISLATION.

As was stated in this column last week, there are now four bills before Congress on the subject of lard. The first was introduced by Mr. Conger, December 18, 1889, and according to its title claims to be a bill to define "lard" and also to impose a tax upon and regulating the manufacture, sale, importation and exportation of compound lard. This bill proposes to compel the manufacturers of compound lard to obtain a license from the Commissioner of Internal Revenue at a cost of $100, and to file a bond to comply with all regulations of the Commissioner, also to have wholesale dealers pay a special tax of $25 dollars and retail dealers $5. Another section provides that every package shall be conspicuously branded or stamped "compound lard," and the names of each ingredient entering into the compound given just as the same is stated in the license under which the same is manufactured. In addition to all this, this bill pro-

vides for a tax of two mills per pound on all compound lard manufactured here, and two cents per pound on all imported compound lard. This bill as it now reads is an iniquitous attempt to hinder the manufacture and sale of an acknowledged pure and wholesome article of commerce for the benefit of a few manufacturers of lard which may consist only of hog's fat, but which may be pure, but in all probability is more adulterated and vastly more repellant than any compound lard. The tax idea, which is added for the purpose of enabling an espionage system to be established is the vaunted invention of Frank B. Thurber, who gained most of his experience in the knowledge of the ways that are dark and tricks that are vain in the adulteration of food products from his partner and brother H. K. Thurber, being then president of the Commercial Manufacturing Company, the largest original makers of oleomargarine, but, who, true to his principle of always keeping with the majority, now poses as the apostle of pure food products only. The sections requiring manufactures to brand their goods is entirely unnecessary as all manufacturers of compound lard have done so for a long time voluntarily, and for their own protection. A second bill to regulate the manufacture and sale of counterfeit or compounded lard was introduced on the same day by Mr. Butterworth. This bill has the merit at least that it includes in its definition of counterfeit lard those lards which are not "compound lard" or clean wholesome products, but the results of nefarious adulterations by lardmakers who pretend to abhor anything but hog's fat but add to make bulk and weight without regard to cleanliness or health, all the offal of the pig sticking establishment and the results of the laboratory, limestone quarry or any other dirt heap that will look like lard. This bill also imposes a tax heavier than the other and intended to be prohibitive. Both of these bills create new duties for and thus keep alive that unpopular relic of the civil war, the Internal Revenue Department, and on behalf of the politicians create a multitude of new offices. The two other bills were both introduced by Mr. McClammy a week apart, and also imposes special taxes and licenses, but in addition, legislate on minor details of lard manufacture such as making a distinction between lard made from different parts of the hog. We have already said enough on the subject of legislation such as this, its motives and results, to convince any fair-minded person that none of these bills are honest, praiseworthy measures for the protection of the public. They are gotten up to make cheap political capital and to harrass honest citizens engaged in legitimate business. They can have only one object, and that is what is commonly called "a strike." The chairman of the Committee on Agriculture to whom these bills were referred has clearly shown his individual feelings in the matter, in the one-sided unfair manner in which he acted at the hearing before his committee. Such laws can only injure us in the eyes of foreign countries and accomplish nothing of any practical good here. Like the outrageous oleomargarine law which public opinion will in time compel Congress to repeal. They are boomerangs that recoil against their projectors leading foreign nations to reject our products, cutting off important outlets for our agricultural staples and thereby lessening the farmers' income. Our farmers have learned to see through these so-called protective laws and when these legislators learn this fact it will be too late for them to retract. Such law-makers will be as they should be, politically buried beyond resurrection.

FAITH CURISTS CURED.

The fanatical organization of so called Faith Curists in Brooklyn, which has several times been referred to in this column was brought into public notice again recently through the action of the authorities interposing, to compel the members to give their sick the benefit of medical attention. The result has been that the fanatics in question have weakened. They now express themselves as convinced that they have been in the wrong, and promise that in future they will conform to the usual methods for the treatment of sickness. On March 11th four delegates from the society, some of the members of which have not reported cases of contagious disease and have failed to call in physicians to attend the sick, called upon the Coroner, and announced a change in their beliefs which would be followed by a change in their practices. They said that those who heard what the Coroner had said the week before at the inquests of two children, whose parents had no medical treatment for them, had been profoundly impressed. The matter had been brought up at the meeting of the society on Sunday and had been made a special subject of prayer, and of asking the Lord for enlightenment. They thought the Lord had opened their eyes and had shown them that they were in the wrong in acting in conflict with the law. They were now ready to call in doctors to attend the sick and would try to live as law-abiding citizens. There is a prospect that this monstrous absurdity will lose the hold it has possessed on the minds of the ignorant and credulous classes, and pass out of public notice.

SUBMARINE INFECTION.

The United States Fish Commission has called attention to a very serious evil which they discovered while investigating the cause of the destruction of the oyster beds in Long Island Sound. It had been supposed that the oysters were destroyed by the starfish but upon making dredgings it was found that the bottom of Long Island Sound even in water over ninety feet in depth was filled with all kinds of decomposed animal and vegetable matter, caused by an accumulation of sewage and offal dumpings from the cities and villages along the Sound. The ebb and flow of the tide through the Sound is not sufficient to scour out this matter but only moves it to and fro along the bottom. In this respect the Sound differs from the Ocean, the bottom of the latter being always clean. Further investigations will be made this summer and careful observation made of the actual rise and fall of the tides in Long Island Sound with a view of suggesting some remedy. As the conditions now are, they are very favorable to the spread of disease if an epidemic like yellow fever should be introduced along the thickly populated shores of the Sound. It is to be hoped that something can be speedily done to prevent an increase of this danger.

A NATIONAL ADULTERATION BILL.

FULL TEXT OF HOUSE BILL 6,830 INTRODUCED BY MR. LEHLBACH, OF NEW JERSEY, FEB. 11, 1890.

A Bill regulating the manufacture, sale, importation, and exportation of adulterated articles of food and drugs, and imposing a tax thereon.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

That for the purpose of this act—

First. The term "food" shall include every article used for food or drink by man other than drugs and water.

Second. The term "drugs" shall include medicines for internal or external use.

Third. The term "pound" shall signify the standard avoirdupois pound of the United States.

SECTION 2. That for the purposes of this act an article slall be deemed to be adulterated—

In the case of drugs;

First. If, when sold under or by a name recognized in the United States pharmacopœia, it differs from the standard of strength, quality, or purity according to the tests laid down therein.

Second. If, when sold under, or by a name not recognized in the United States pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity according to the tests laid down in such work.

Third. If its strength or purity fall below the professed standard under which it is sold.

In the case of food or drink:

First. If any substance or substances have been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength and so that such product when offered for sale shall be calculatad or shall tend to deceive the purchaser.

Second. If any inferior substance or substances have been substituted wholly or in part for the article so that the product when sold shall be calculated or shall tend to deceive the purchaser.

Third. If any valuable constituent of the article has been wholly or in part abstracted so that the product when sold shall be calculated or shall tend to deceive the purchaser.

Fourth. If it be an imitation of and be sold under the name of another article.

Fifth. If it be mixed, colored, powdered, or stained in a manner whereby damage is concealed so that such product when sold shall be calculated to deceive the purchrser.

Sixth. If it consists wholly or in part of a diseased, filthy or decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal:

Provided, that no article of food or drugs shall be deemed to be adulterated—

A. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names and not included in definition fourth in this section aforesaid.

B. In the case of articles labeled so as to indicate plainly that they are mixtures, compounds, combinations, or blends.

C. When any matter or ingredient has been added to the food or drug because the same is required for the production or preparation thereof as an article of commerce in a state fit for carriage or consumption, and not fraudulently to increase the bulk, weight, or measure of the food or drug or conceal the inferior quality thereof.

D. Where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation.

E. In the cases prescribed and exempted in and by

sections thirty-four hundred and thirty-six of the Revised Statutes of the United States.

SEC. 3. That special taxes are imposed as follows:

All manufacturers of food or drugs which are to be transported for consumption in other S ates or Territories or foreign countries shall pay twenty-five dollars.

Every such manufacturer who carries on business without having paid the special tax therefor, shall besides being liable to the payment of the tax, be fined not less than five hundred dollars and not more than five thousand dollars.

That every such manufacturer shall file with the collector of internal revenue of the district in which his manufactory is located such notices, inventories, and bonds, shall keep such books or render such returns of materials and property as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may, by regulation, require.

SEC. 4. That there shall be levied and collected a tax of one mill per pound upon and in respect of every article of food and drug adulterated within the meaning of this act, and manufactured and sold, or removed for consumption or use to be paid by the manufacturer thereof, and any fractional part of a pound in a package shall be taxed as a pound.

The tax levied by this section shall be represented by coupon stamps, and the provisions of existing laws governing the engraving, issue, sale, accountability, effacement, and destruction of stamps relating to tobacco and snuff, as far as applicable, are hereby made to apply to stamps provided for by this section; but such stamps shall bear the words: "Internal revenue—adulterated food and drug tax."

SEC. 5. That adulterated articles of food or drugs shall be packed by the manufacturer thereof in packages not before used for that purpose; and all sales by manufacturers of such articles and by dealers therein shall be made in or from original stamped packages and not otherwise.

Every manufacturer of any such adulterated article who knowingly sells or offers for sale or delivers, or offers to deliver, or removes for consumption or use, any such adulterated article in any other form than in packages as above described, or affixed a stamp on any package denoting a less amount of tax than that required by law, or who omits to affix such stamp or stamps to any such package containing such adulterated article, shall be fined twenty-five dollars for the first offense, one hundred dollars for the second like offense, and five hundred dollars for each subsequent like offense, or imprisonment for not less than three months nor more than one year, or both.

SEC. 6. That every person who knowingly purchases or receives for sale any such adulterated article which has not been stamped according to law shall be liable to a penalty of ten dollars for each offense

SEC. 7. That the absence of the proper stamps on any package of such adulterated article shall be notice to all persons that the tax has not been paid thereon and shall be *prima facie* evidence of the non-payment thereof.

SEC. 8. That every person who affixes to any package containing any such adulterated article any false, forged, fraudulent, spurious, or counterfeited stamp, or a stamp which has been before used, shall be deemed guilty of a felony, and shall be fined not less than one housand dollars nor more than five thousand dollars, and imprisoned not less than two years nor more than five years; and any person who shall willfully remove or deface the stamps on the package containing any such adulterated article shall be guilty of a misdemeanor and shall be punished by a fine of not less than one hundred dollars nor more than two thousand dollars, and by imprisonment for not less than thirty days nor more than six months, or both.

SEC. 9. That whenever any manufacturer of adulterated articles sells, or removes for sale or consumption, any adulterated article upon which the tax is required to be paid by stamps, without the use of the proper stamps, it shall be the duty of the Commissioner of Internal Revenue, within a period of not more than two years after such sale or removal upon satisfactory proof, to estimate the amount of tax which has been omitted to be paid, and to make an assessment therefor and certify the same to the collector. The tax so assessed shall be in addition to the penalties imposed by law for such sale or removal.

SEC. 10. That whenever any stamped package containing adulterated articles is emptied it shall be the duty of the person in whose hands the same is to destroy utterly the stamps thereon; and any person who willfully neglects or refuses so to do shall for each such offense be fined not exceeding ten dollars. And any person who fraudulently gives away or accepts from another, or who sells, buys or uses for packing adulterated articles any such stamped package shall, for each such offense, be fined not exceeding one hundred dollars and be imprisoned not more than one year.

SEC. 11. That all adulterated articles imported from foreign countries shall, in addition to any import duty imposed on the same, pay an internal-revenue tax of one mill per pound, such tax to be represented by coupon stamps, as in the case of adulterated articles manufactured in the United States. The stamps shall be affixed and canceled by the owner or importer of the adulterated article while it is in the custody of the proper custom-house officers; and the adulterated article shall not pass out of the custody of said officers until the stamps have been so affixed and canceled, but shall be put up in packages as prescribed in this act for adulterated articles manufactured in the United States. Whenever it is necessary to take any adulterated article so imported to any place other than the public stores of the United States, for the purpose of affixing and canceling such stamps, the collector of customs of the port where such adulterated article is entered shall designate a bonded warehouse to which it shall be taken, under the control of such custom officers as such collector may direct; and every officer of customs who knowingly permits any such adulterated article to pass out of his custody or control without compliance by the owner or importer thereof with the provisions of this section relating thereto shall be guilty of a misdemeanor, and shall be fined not less than two hundred dollars nor more than two thousand dollars, and imprisoned not less than six months nor more than three years. Every person who sells or offers for sale any imported adulterated article, or adulterated articles purporting or claimed to have been imported, not put up in packages and stamped, as provided by this act, shall be fined not less than three hundred nor more than two thousand dollars, and be imprisoned not less than six months nor more than two years.

SEC. 12. That such adulterated articles may be removed for export to a foreign country under such regulations and giving such security as may be prescribed by the Commissioner of Internal Revenue and approved by the Secretary of the Treasury; but such articles so designated for exportation, and exported, shall not be subject to the tax imposed under this act, nor shall it be necessary to affix or place any stamps, brands, marks, or labels thereto or thereon.

SEC. 13. That the Secretary of the Treasury is hereby authorized and required, immediately after this act takes effect, to appoint a competent chief analytical chemist and a competent chief microscopist in connection with the office of the Commissioner of Internal Revenue at Washington, and who shall each receive a salary of two thousand dollars per annum; and also to appoint, not exceeding one hundred persons residing in such parts of the United States as he may deem best suited for the purpose, who shall possess competent knowledge, skill, and experience, and be of good character and standing in the community wherein they dwell, as analysts of articles of food and drugs for the place or district to be prescribed by the Secretary of the Treasury. He is also authorized to fill vacancies in such offices as they occur, and to annul any such appointment, in his discretion; and he may employ such other chemists, microscopists, inspectors, clerks, and assistants as he may deem necessary for the proper enforcement or this act; and he shall fix the salaries or compensation of all such persons, but not exceeding in the aggregate any appropriation made for that purpose.

It shall be the duty of all analysts appointed by or under this act to make analysis of any article of food or drug which may be presented to them for that purpose by any officer of the Treasury Department charged with the duty of enforcing any of the provisions of this act, and to deliver to such officer his certificate showing the result thereof, and to facilitate and assist in the operation and enforcement of this act. No person shall be appointed as an analyst or microscopist under this act who shall be engaged directly or indirectly in any trade or business connected with the sale of food or drugs, or who is connected directly or indirectly with any person engaged in such trade or business.

Such analysts and microscopists shall report monthly to the Commissioner of Internal Revenue the number and kind of articles analyzed by him under this act during the foregoing month, and shall specify the result of each analysis and the name of the official for whom the same was made.

SEC. 14. That reports shall be printed and published by said department from time to time containing the results of analysis made under this act in the case of articles found to be adulterated and liable to taxation with lists of articles, mixtures, and compounds decided to be exempt from taxation under this act.

SEC. 15. That the Secretary of the Treasury shall report annually to Congress, at the commencement of each session, full particulars of the workings and operation of this act; and it shall be the duty of the Commissioner of Internal Revenne to make a full report thereof to the Secretary of the Treasury as often as requested so to do by the latter.

SEC. 16. That it shall be the duty of every district attorney to whom the Secretary of the Treasury, the Commissioner of Internal Revenue, or any collector of customs shall report any case which they may respectively believe to be a violation of this act to cause proper proceedings to be commenced and presented without delay for the fines, penalties, and punishments in such case provided. And for the expenses incurred and services rendered in all such cases the district attorney shall receive and be paid from the Treasury such sum as the Secretary of the Treasury shall deem just and reasonable, upon the certificate of the judge before whom such cases are tried or disposed of. And it shall be the duty of the officials now charged by law with the enforcement of the collection and recovery of fines, penalties, and punishments for violations thereof to enforce the provisions of this act.

SEC. 17. That all fines and penalties imposed by this act may be recovered in any court of competent jurisdiction.

SEC. 18. That the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may make all needful regulations for registering and inspecting plans of manufacture of food and drugs and for carrying the provisions of this act into effect.

SEC. 19. That this act shall go into effect on the first day of January, eighteen hundred and ninety-one, and all packages of such adulterated articles found on the premises of any dealer or manufacturer on the second day of January, eighteen hundred and ninety-one, shall be deemed included within the provisions of this act, and be liable and taxable and taxed hereunder, and shall have affixed thereto the stamps required by this act or by regulations made pursuant to this act; and such stock on hand at said date may be stamped under special regulations of the Commissioner of the Internal Revenue, approved by the Secretary of the Treasury.

SEC. 20. That all acts and parts of acts inconsistent or in conflict with the provisions of this act be, and the same are hereby, repealed.

ANCIENT SCIENCE.

THE SCIENTIFIC KNOWLEDGE OF THE ANCIENT GREEKS AND ROMANS.

(Concluded from page 90.)

ASTRONOMY.—So much attention was given to this branch of science, and so much progress was made, that only a very brief survey of the field can be made in this article. The Greeks began at very early times to observe the heavens, and to distinguish the heavenly bodies from one another. In the poems of Homer mention is made of the Pleiades, Hyades, Orion, Sirius, the Great Bear and Arcturus. The morning and evening stars are spoken of, but their identity is not suspected. The earth is conceived to be a disc, around which flows the stream of Oceanus. Thales of Miletus, one of the "Seven Wise Men of Greece," who lived at the end of the seventh century before our era, looked on the heavens as a hollow sphere divided into five zones. He discovered the true causes of the phases of the moon and of eclipses, and is said to have foretold an eclipse of the sun which occurred during the reign of Alyattes of Lydia, in the year 609. Anaximander, his great successor, held that the earth had the form of a cylinder, suspended in the middle of the universe, and that men dwelt on its base. It was surrounded by water, air and fire in successive layers. This fire, shining through different openings, took the form of the sun, the moon and the stars. The first to turn his attention to the planets was Anaximenes. He looked on them as flat discs, supported by the air between the earth and the arch of heaven. Heracleitos believed that the heavenly bodies were shaped like cups. When these were turned towards the earth, they caught its vapors, which took fire and reflected their flame. When they were turned from the earth darkness ensued. By the time of Anaxagoras, who lived in the fifth century before our era, the spherical form of the earth was known. The first to elaborate a regular cosmic system was, apparently, Pythagoras, although it is difficult to distinguish his own personal work from that of his successors. This system, as finally elaborated, was as follows: In the centre was an ever-burning fire, not the same as the sun. Around it revolved the sun, the moon, the earth, the five planets (Saturn, Jupiter, Mars, Venus and Mercury), and the sphere containing the fixed stars. There was assumed to be the *counter-earth*—probably merely to make up the number ten—which was distinct from the earth itself, but always moved parallel to it at a distance of 180°. Pythagoras defined the inclination of the courses of the planets and of the ecliptic. Aristarchus of Samos, in the fourth century B. C., first made the sun the centre of the universe. Copernicus mentions three other Greeks as predecessors of his in this regard. Aristotle wrote a work in four books on astronomy. He gives various proofs of the spherical shape of the earth, among others the circular shape of the edge of the earth's shadow in a partial eclipse of the moon. He also discusses comets and meteors, and the nature of the milky way, which he believed to be formed of myriads of small stars. Aratus, an Alexandrine astronomer of the same century, gave especial attention to the constellations, whose form and location in the heavens he describes as a didactic poem. Many attempts were made to ascertain the size of the earth. The method of Eratosthenes was, perhaps, the most ingenious. He was informed that Syene in upper Egypt, near the modern town of Assouan, deep wells were lighted to their bottoms at the time of the summer solstice, and that vertical objects cast no shadows. He observed the inclination of the sun in Alexandria (z), and got the distance from Syene to Alexandria (d) from the Egyptian tribute-lists. He then calculated the circumference of the earth (u) from the proportion

$$u : d = 360 \text{ deg.} : z \text{ deg.}$$

His result was 250,000 stadia. We do not know what stadium he used, but in any case (the stadium is, roughly, an eighth of a mile) his result was a creditable one, considering the means he employed. To discuss, even briefly, the discoveries and theories of Ptolemaius (Ptolemy), would be to write a history of astronomy. The chronicle of the science for many centuries consists merely of comments on his works. The Romans did but little in astronomy. That they were not keen observers is sufficiently shown by the fact that for one hundred years they used a sun-dial brought from Catania, in Sicily, as a public time-piece, without noticing the errors due to the height of the gnomon, which was intended for a more southern latitude. Their most distinguished astronomer was Julius Cæsar, whose reform of the calendar is too well-known to be more than alluded to.

PHYSICAL GEOGRAPHY.—Intercourse with Egypt led the Greeks at an early period to speculations about the causes of the rising of the Nile. The great traveler and historian, Herodotus, mentions three views which were current in his time. Two, he says, are hardly worth mentioning, while the third (that it is caused by the melting of great quantities of snow) he objects to, on account of the heat of Libya, which would make the existence of snow impossible. The real explanation had its advocates in very early times. The alluvial formation of the Nile delta is also referred to by Herodotus. Earthquakes, which have always been common in Greece, early became the objects of investigation. Anaximander thought them caused by rifts in the earth, the result of long droughts; while Anaxagoras believed that masses of air imprisoned in the earth and trying to force their way out, were the cause of these disturbances. Aristotle agrees with this latter theory. Aristotle also considers the question of the saltness of the sea, which he thinks due to chemical changes wrought by the sun when the water is taken up by it. He believes it can be got rid of by filtration and boiling. Strabo first observed the fall in temperature as the elevation increases, and the fact that trees were confined to certain elevations as well as to certain latitudes. Among the Romans, Seneca is the foremost writer on physical geography. In his *Naturales Quæstiones* he discusses the erosive forces of water, both mechanically and chemically. He observes that the spring tides are caused by the attraction of both sun and moon together. He defines volcanoes scientifically, distinguishing them from subterranean fires. He does not believe that the earth is a mass of fire within, but that there are collections in different parts of its crust. On the subject of earthquakes he agrees with Anaxagoras and Aristotle, but considers the imprisoned force to be gas or vapor rather than air. In the science of navigation little progress was made, since voyages were only along the coast. In the open sea "dead-reckoning" (by course and distance) was employed, the distance being merely inferred, while the course was got from constellations. Lighthouses and beacons are of ancient date, and charts were employed at a comparatively early period.

MINERALOGY.—The industrious Pliny was the first to collect the results reached on this subject. He knew a great many varieties, although, of course, not the metals (like platinum, cobalt, nickel, etc.), which are not found in the Grecian and Italian mountains. He enumerated most of the signs by which mineralogists to-day distinguish different varieties—shape of crystals, cleavage, hardness, color, transparency, weight, lustre and grain.

BOTANY.—The Greeks were probably led to the study of this science by the Egyptians, who turned their attention to it at a very early date. They found a richly developed flora in their own country, although many forms of vegetation, associated in our minds with the name of Hellas, first found their way there from the East, in comparatively late times. The natural philosophers were too much taken up with the consideration of larger subjects to give much attention to the study of vegetable life, but the extensive use of plants for medicinal purposes must have led to a considerable knowledge of the subject. Aristotle wrote a *Theory of Plants*, which seems, however, to deal mainly with the analogies and contrasts between plants and animals. Theophrastus of Lesbos, in the fourth century before our era, wrote a work in nine books on botany, in which he considers the anatomy and physiology of plants, and their dependence on climate and cultivation. The Alexandrines confined themselves to the relation of botany to medicine, and the same is true of the Romans.

ZOOLOGY.—The knowledge of the ancients in this branch of science was by no means insignificant, and interest in it was kept up by the chase, and the popularity of fights between wild beasts in later Roman times. One writer, Aristotle, treats the subject so exhaustively that his succcessors did no more than comment on his work. He knew five hundred different varieties of animals, not all of which can be exactly identified at the present day. Much that is common now-a-days was unknown to him. He knew but four species of apes, and nothing at all about the man-monkeys. His knowledge of reptiles and their geographical distribution is very limited. Fishes, from gastronomic reasons, were better known. Of the lowest forms of animal life there was no knowledge at all in the ancient times. Aristotle is said to have been furnished with material for study by his pupil, Alexander the Great, but he appears from his description never to have seen an elephant or an ostrich. He studied the internal structure of animals also, but was hampered in his investigations by the proconceived notion that the heart was the centre of the nervous system. We are unable to learn just how much he did know of this branch of the subject, as his special book on *The Anatomy of Animals* is known to us only by its title. Pliny gave four books of his *Natural History* to animals, but it is in no way orignal. Ælian describes some new varieties, especially of fishes.—*Dr. J. C. Rofle, in Pop. Science News.*

APOSTROPHE TO THE BOTTLE.

"A big-bellied bottle's the cure of all cares."—
Old Song.

With the exception perhaps of "The Leather Bottel" and Cruikshank's famous series of cartoons of "The Bottle," bottles have not obtained due recognition in the world of art and letters, which, to speak frankly, owes them so much. In old days, says the *Table*, it was a fine thing to be styled by one's contemporaries "a three-bottle man." This was before the days of ginger ale and lemonade. Steele and Fielding owed much to the bottle, and were not ashamed of the fact. The new wine which had such an unfortunate effect on Noah probably came out of a gourd, though it is just possible that the vessel containing the grape juice was made from the skin of a goat (the hair on the inside) well sewed and pressed together, with one of the paws as a cork; for this was the Jewish substitute for the gourd. The Roman ladies preserved their tears in tiny stone jars; and for a long time stone and earthenware vessels, as well as skins, formed the only receptacle for liquids. Wines were kept in huge tanks. This led to several unhappy incidents,—to wit, the drowning of the Duke of Clarence in a butt of fine Malmsey,—all for want of a bottle—or bottles. Although good English ale was often praised in prose and verse, the "bottle department" of the beer trade was evidentlo *terra incognita* in those days, for so runs a mediæval rhyme,—

"He that buys land buys many stones;
He that buys flesh buys many bones;
He that buys eggs buys many shells;
But he that buys ale buys nothing else."

Which shows that land-owners and housekeepers grumbled even then as now, and that the beer-drinker alone was satisfied with his lot. We owe the invention of bottled beer to no less a person than the grave divine,

Nowell, dean of St. Paul's; for leaving one day in the grass some ale that he had put in a bottle to take out as refreshment whilst fishing, he found it some days after no bottle, but a gun, such the sound at the opening thereof; and the contents so exhilarated the worthy man that he hastened to acquaint his friends of the effects of bottling upon ale, and many have since profited by his discovery. King Francis I. had a singular liking for quaint bottles and during his reign bottles rose in estimation, being blown into divers shapes, comprising heads, hearts, and even trees. Several great men have had a weakness for the bottle—contents apart. Napoleon I. always carried a flask of cunning build, half iron, half glass, with him on the field of battle. Byron affected very slender-necked bottles, made of the thinnest glass, encased in rush plating. A well-known French novelist has an ink pot simulating a champagne bottle. The designing and making of bottles has grown into an art in Austria. Various and exquisite are the colors and tones employed in their manufacture. It is no uncommon thing for the coat-of-arms of the family to whom they are going to be embossed in relief on the side of every bottle, thin fillets of gold and silver encase them; and a Hungarian bottle is often a work of art, independently of its contents. In Japan and China they wrap their bottles round in richly-embroidered silks and stuffs. In Spain the glass is blown into a sort of wooden cup, which forms the base of the bottle. On the banks of the Rhine the wine-flagons have necks sometimes as much as a yard long; this is equally the case in Tuscany. Russian bottles are generally quite white, but abound in fantastic shapes and twisted necks. At Caen there is a bottle much appreciated by art-lovers, covered with gold fleurs-de-lis and vine-leaves burned into the glass. At one time bottles blown into the form of Napoleon I.'s tomb appealed to the feelings of Imperialists; again, to drink *vermoutte* out of the Bastille Column charmed Communists. Now both these gentry content themselves with the common green glass bottle, which has given a new color to art, *verte bouteille.* The *genre* of bottle used is declared by some epicures to affect the quality of the wine contained therein. Be that as it may, no man with a proper consideration for the palates of his guests should allow old wine to be decanted anywhere but into their wine-glasses. Much, very much, lies in the way in which a bottle is uncorked. Dean Swift, in his directions to servants, says, "A good butler always breaks off the point of his bottle-screw in two days, by trying which is the hardest, the point of the screw or the neck of the bottle." And it is unfortunately possible to do this without being "a good butler," as many of us have proved. The cork is also an important element in the bottle, and this is not considered enough by modern cellarists. As said Warton,

"When calm around the common room,
I puff my daily pipe's perfume!
Rode for a stomach, and inspected
At annual bottlings, corks selected."

A corkscrew ought really never to be applied to a bottle containing sparkling wine; this is, of course, specially the case with champagne. Some, when uncorking sound claret or old port, shake the bottle. This is a barbarism of the worst description. It is considered very bad taste to drink out of the bottle, yet the last two kings of England rejoiced in doing so when in private. Then there are a variety of bottles appreciated by all sorts and conditions of men and women. Medicine bottles, smelling-bottles, and last, not least, hot bottles are justly said, in common with other bottles, to be the place where discontent seeks for comfort, cowardice for courage, and bashfulness for confidence. One word more: no one should forget, when speaking of bottles, the feeding-bottle, which is often a man's first introduction to what may prove, in its different phases, the joy of his middle life and comfort of his declining years.

So never forget to say a good word in favor of the Bottle.

HUMAN HAIR IN COMMERCE.

ONE ADVANTAGE THAT THE RED HEADED GIRL HAS OVER THE WHITE HORSE.

Of all the crops that grow there is not one which occupies so small a space and is so valuable as a plentiful crop of the hair. Most of us are familiar with a charming story wherein the heroine, to meet a family financial crisis, parts with an abundant crop of beautiful brown hair. What we do not as a rule know is where all the hair we see in shops come from, and also we are at some loss to make out where the enormous mass of it which we see worn by ladies of our acquaintance grew, and which, in many cases, we have grave reasons for being certain was not raised on the premises. As a matter of fact, in remote Swiss, German and French villages, traffic in human hair is as recognized a portion of the commerce as the sale of butter and eggs, and is, to the young peasant girls, a very important matter. They grow their hair with a view to selling it, just as their fathers and brothers grow their cereals and raise their cattle for the same purpose. In many cases where they are fortunate enough to have it of a good marketable color and fine texture, they get for their ware more than their male relatives could hope to clear after many years of hard toil. The great drawback to the lucrativeness of hair farming is the slowness of growth and the fact that the same head is rarely known to produce a remarkably fine crop twice. An objection to it is a dislike, natural in a woman, to part with what is a nature-given ornament. We may feel positive that in the districts where hair is sold it is a proud distinction to be in constant possession of a good crop which is definitely understood to be "not for sale," and which argues well for the amount of worldly goods enjoyed for its possessor. Here, where there is no recognized commercial value placed on luxuriant locks, it was, a year or two ago, quite fashionable to have hair short and wavy like a man's. There, however, the consolation has to be administered in the shape of hard cash, and even with that great consoler in their hands the peasant hair-growers can seldom see their shorn tresses gathered up by the indifferent purchaser with equanimity. One village market is held every second Friday, and is attended by buyers from Paris only. These walk about the street—the village boasts but one long narrow one—whilst the girls stand about in couples so that they may give each other moral support. The business is transacted in a large room. The sellers, having had their hair combed out and examined, wait for an offer. If this be satisfactory the buyer takes up a bright pair of shears fastened to his waist, and cuts the treasured tresses, papering and pocketing them quickly so that the denuded girl may see as little of them as possible once they have passed out of her possession. She then goes off and uses all the means she knows of to cultivate a good crop, which occasionally is successful up to the third and even fourth transactions, though rarely is the first bargain bettered. The crop, however, is capricious; occasionally a second growth and a third have been known to exceed the first in length and fineness to a surprising degree, though, if the color be fair, and particularly of golden sheen, the second crop even, is, almost invariably, not satisfactory in this one particular. Purely white hair, if long and fine, may be converted into a little fortune by its possessor, supposing she be so minded. Albino women have been known to obtain for a crop of hair white as snow and fine as spun silk, the nice little sum of $750, which certainly would make hair farming a remunerative occupation, supposing that only two such crops could be raised and disposed of in a lifetime. It is said that the French ex-Empress paid $200 an ounce for hair to match her own, which was, in her youth, that much prized hue which is the same as virgin gold. The difficulty of exactly matching hair is much greater than might be supposed by the casual observer, who sees only the four colors known by hair experts as type colors, white, black, brown and blonde. Each of these produce numerous shades not less than sixteen of every type, and the subtle difference in these shades of hair is wonderfully preceptible, as those who have a little and want to match it, speedily find out. Hair which is artificially colored to match is most unsatisfactory, as the hue is not stationary. Hair dyed on the head is a far from enviable possession, as it requires frequent re-dippings, and its owner (the ways of hair-dye being inscrutable) has usually to disappear from social ken during the process. Not alone that fact, but also that medical men declare softening of the brain to be brought on by the use of hair-dye as well as diseases of the eye, makes this a most undesirable practice. A fine head of virgin-gold colored hair will bring from $200 to $500, according to its length and luxuriance, and to those who have it and are anxious to convert it into hard cash, it may be pleasing to hear that there are orders in advance for all that can be produced of this description for the next five years. The wig-making business absorbs much of the hair brought into the market. It is a trade requiring such an amount of patent monotonous eye-aching work, that it is far from popular though well paid. The foundations of the best wigs are made from human hair, which, when stretched over the scalp, is so fine as to be really imperceptible. Each hair is then knotted in separately until the wig is of sufficient thickness. This is done by hand, and the knots are so close and fine that they look exactly like the root of the hair, and are calculated almost to deceive the wearer into thinking it growing. To make false fringes and fronts which will remain always in curl, only the curly tips of hair are used, and these are made in the same careful way as the larger wigs. Only these waving tips of human hair being used makes such things expensive, as straight hair is no use to them. Taking this into consideration, with the great trouble of founding and knotting, such an article, in ordinary colored hair, is not very dear at five guineas. Very fair imitation hair is also prepared for the market, and used, of course, being much less expensive than real hair. This latter, when bought, is carefully cleaned, every separate hair run through the eye of a needle and polished. Pure black hair is very rare and expensive. Some of our Indians are celebrated for possessing marvelously long fine hair of this coveted blue-black hue. They so far have not been impressed with the advantages of turning hair farmers, and prefer their hair to its equivalent in filthy lucre. The Japanese women, who also have this blue-black hair, regard it as a great beauty, take much pride in dressing it, an operation which they take great care not to perform too often, and do not evince the smallest inclination to use it in a commercial way. Their Chinese sisters, on the other hand, frequently dispose of their locks, but as a rule, these are uncompromisingly straight, rather coarse, and possess only the advantages of length and color.—*Chatter.*

A DANGEROUS TOOL.—M. de Freycinet, the French Minister of War, has published a decree forbidding surgeons in the French army to make use of hypnotism in their practice, or to experiment with it.

PROBABLY.—A new western postoffice has been named Malaria, probably because the mail service of the place is intermittent.—*Medical Classics.*

CORK ROPE.—A cork core floating rope has been invented. The inventor claims that his floating rope of one inch thickness will stand a strain of more than 1,000 pounds. The rope consists of a core of small round corks about three quarters of an inch long, placed end to end, around which is braded a network of cotton twine. This is surrounded by another layer of strong cotton twine, braided in heavy strands, which is about a quarter of an inch thick. The rope is very soft and pliable, and even after being tied into a small knot will return to its original shape. It can be used in life lines or life rafts, and as a heaving line to tie heavy hawsers to. At a life-saving station such a rope would be very valuable.

POSTAGE STAMPS.

HOW THEY ARE PREFACED FOR LINGUAL CONJUNCTION.

As soon as they emerge from the hydraulic press, postage stamps are gummed. The paste is made from clear starch, or rather its dextrine, which is acted upon chemically and then boiled, forming a clear, smooth, slightly sweet mixture. Each sheet of stamps is taken separately, placed upon a flat board, and its edges covered with a light metal frame. Then the paste is smeared on with a wide whitewash brush, and the sheet is laid between two wire racks and placed on a pile with others to dry. Great care is taken in the manufacture of this paste, which is perfectly harmless. This gratifying fact has been conclusively proved by an analysis recently made by an eminent chemist. After the gumming another pressing in the hydraulic press follows. Then another counting—in fact, stamps are counted no less than thirteen times during the process of manufacture. The sheets are then cut in half, each portion containing one hundred stamps, this being done by girls with ordinary hand shears. Next follows the perforation, which is performed by machinery. The perforations are first made in a perpendicular line and afterwards in a horizontal line. Another pressing follows—this time to get rid of the raised edges on the back of the stamps made by the dies, and this ends the manufacture. A separate apartment is devoted to the picking and sending off the stamps to different post-offices. It will be seen by this account that any absurd rumor concerning the poisonous or unclean properties of postage stamps is utterly without foundation.—*U. S. Mail.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

March.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, veal.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Bass, cod, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish, trout.

VEGETABLES.—Artichokes, beans, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress.

FRUITS.—Apples, bananas, oranges.

PRACTICAL RECIPES.

RAGOUT OF COLD VEAL.—Slice some boiled or roasted veal and dip the pieces into flour, then fry them in butter to a light brown; remove them from the pan, into which pour a little hot water; thicken the gravy thus made with a little flour mixed with water; season with salt, pepper, nutmeg or catsup and a little lemon juice, and if liked a small chopped onion; return the meat to gravy and stew until very hot. Serve.

BEEFSTEAK PIE.—Cut pieces of cold steak or roast beef into thin slices about an inch and a half long, peel some raw potatoes and cut them into thin slices; butter baking dish and put in it alternate layers of beef and potato until it is full, sprinkling in bits of finely chopped onion and a little pepper and salt on each layer, on the top layer put a few pieces of butter, pour enough boiling water on to fill up the dish, add an upper crust and bake.

MRS. P'S GRAHAM CAKES.—Two cupfuls Graham flour, one cupful white flour, three cupfuls sour milk, one teaspoonful soda dissolved in hot water, one teaspoonful salt, one tablespoonful lard, three well-beaten eggs. Mix well and bake immediately.

MRS. P'S RISEN BISCUIT.—One quart sweet milk, three-quarters cupful butter, three-quarters cupful yeast, two tablespoonfuls sugar and one teaspoonful salt; flour to make a soft dough. Warm the milk slightly, add the melted butter and set with half the flour in a thin sponge. Let it rise for five hours then work in the rest of the flour and let it rise for five hours longer; then roll out into a sheet three-quarters inch thick, cut into round cakes, set closely in a pan and let rise for half an hour, bake twenty minutes.

TAPIOCA CUSTARD.—Soak five dessert-spoonfuls tapioca in one pint cold water five hours. Let one quart of milk come to a boil in a farina kettle, add the tapioca and water and a little salt; stir till boiling hot, then add the beaten yokes of three eggs and one heaping cup sugar. Stir constantly for about five minutes but do not let it get too thick or the custard will break. Pour it into a bowl and whisk in gently the beaten whites of the eggs. Flavor with a teaspoonful vanilla and let it get very cold before serving. Serve with canned or brandied fruits.

BATTER PUDDING.—Eight eggs, eight tablespoonfuls flour, one quart milk; steam for two hours. Serve with hard sauce flavored with lemon or brandy.

FRENCH CAKE.—Two cupfuls sugar, one-half cupful butter, one cupful milk, three eggs, four cupfuls flour, two teaspoonfuls Horsford's baking powder sifted with the flour. Flavor with spices.

RUSSIAN FRUITS.

EFFECTS OF A COLD CLIMATE IN MODIFYING THE SIZE AND PRODUCTIVENESS OF FRUIT TREES.

The extreme cold to which vegetation in Russia is subjected has effectually killed many varieties of fruits which are too tender for the climate. It has been commonly found that the fruits which can exist and thrive under these adverse conditions when brought to a milder clime like the United States, prove of great value, not alone retaining their hardihood but also apparently displaying gratitude by an increase in bearing capacity. Among the plants obtained which have proved of especial usefulness in this country can be named the Russian cherries, plums and apples in considerable variety. In portions of Russia every available spot s given up to the production of fruit. At Valdimir, cherries are a specialty, and orchards of 10,000 to 15,000 trees (or rather bushes, for the cherry does not attain great size there), are not uncommon. The temperature often falls as low as 58 degs. below zero. During the short summers Moscow and the cities of Southern Siberia are overwhelmed with this luscious fruit. Simberisk, located in the dry steppe region, 500 miles south of Moscow, on the black prairie soil, is a literal swamp of apple, pear and plum trees. A peculiar characteristic of fruit growing is the extreme provincialism of the business. Varieties grown in one province and very common and popular, are utterly unknown, or known by an entirely different name in another locality comparatively a few miles distant. The apple tree is usually small in size, bushy in its habits of growth and loaded with showy and excellent fruit. The same growth characterizes the ravages of insects. Apples are set as closely as the American method of setting grapes; cherries and plums are not more than five feet apart. This region, as is well known, is one thousand miles north of the line stretching in the United States from Newburg on the Hudson to Des Moines, Ia. The dry summers and cold winters make the average life of these trees short. The true iron-clads have the foliage and habits of growth of the wild apples found on the bluffs of the Upper Volga. The trees are low and scrubby, but rich in their production of good fruit.

PURE WATER.

SOME SUGGESTIONS ON THE PURIFYING OF THE WATER WE DRINK.

Next to air, water is the most immediate necessity of human life. Without air one can exist but a few moments; without water life cannot be prolonged more than a few days. The human body is largely composed of water, being about seven-eighths by weight of this substance. Water is being continually eliminated from the body in proportion to the amount that is taken in. This averages, including what is contained in our more solid food, at least two quarts a day. It is the agent by which the functions of the body are carried on, supplying many of its various wastes, and giving material for its processes. Indeed, a human being may be almost described as an animated pipe. Water is drunk primarily because it is water, and a certain amount of it must be daily taken into the system. It almost always contains extraneous matter, and this extraneous matter may or may not be harmful. The more nearly drinking water approaches to perfect purity, aside from a certain amount of dissolved gases which impart to it a slight pungency of taste, the better will it fulfill the office of a solvent in the body; the more easily will it be assimilated, the more easily will it pass or osmose through the membranes, and the greater will be the amount of solid substances that it will dissolve and eliminate. Aside from the freedom of a water from dissolved mineral matters, which make it "hard" or impart other properties to it, water may contain certain deleterious matter, which may cause it to become the means of imparting to those who drink it serious functional disorders, and often fatal diseases. It might be thought, in view of the care that is usually exercised in peeling, cleaning and otherwise carefully preparing before eating vegetables dug out of the earth as well as those that are not, that considerable care would be exercised in purifying the water that is drunk. But this is not generally the case. The ordinary surface well is a hole dug in the ground, and the water that oozes into it usually contains the dissolved impurities of the soil, putrefying vegetable and animal remains, as well as the pollutions from leaching cesspools and other similar abominations. So long as it is bright and sparkling it is considered both palatable and safe. But scientific investigation has shown that the sparkle of a water may be due to an excess of dissolved carbonic acid gas, and this condition may be the result of the putrefaction of organic matter; and that even when clear, sparkling and palatable, water may still be superlatively dirty and deadly. Biological investigation has established the fact that many diseases, such as typhoid fever, for instance, may be imparted by minute organisms popularly known as "germs," or more scientifically as "microbes." These minute organisms are given off by the patient suffering from the disease; and when they are transmitted to others, which happens in many ways, and very frequently by the agency of water as a conveying medium, they take up their abode in various organs of the human system. There, when the conditions are favorable, they develop, and live at the expense of their host, causing the functional disorders known as disease. Many sad instances of the effects caused by drinking polluted waters could easily be adduced. Water that is free from such pollution, but is simply turbid from suspended matter, as clay and the like, is unpalatable from its repulsive taste and appearance. During the last few years the subject of water purification has received much attention, and successful methods have been introduced for filtering and purifying water on a large scale. Filtration on a small scale, while successful in many cases, comes, as a rule, under what is at present alleged to be housekeeping, and the success or failure of the method will, therefore, often depend entirely on the operative ability of some crude specimen of domestic home rule, a form of despotic government which has attained an extremely

luxuriant growth in this country. While I do not wish to undervalue any of the excellent small filters now on the market, I desire to explain a simple method by which any housekeeper of average intelligence can make an inexpensive contrivance which will do its work in a way not easily surpassed either in results, efficacy, rapidity or simplicity by any filter that can be bought. Such a filter can be set up in a short time at any place, and will be found particularly useful when one is away from home; for then special appliances are not always easy to obtain. My attention was directed to this subject several years ago, and after some experimenting a simple apparatus was devised. Since then I have continued to experiment on this subject, and am more fully convinced than ever of the practical utility and efficacy of the method. It has been known for many years that the addition of a minute amount of alum to a water containing bicarbonate of lime in solution (and most natural waters contain more or less of this substance) will cause the formation of a gelatinous precipitate. This precipitate entangles and collects the suspended matters and germs, forming coagulated or agglomerated masses which are easily removed by simple filtration. Waters containing clay or mud which is so fine that a mechanical filter cannot remove it, when treated with a small amount of alum can be filtered perfectly clear through a coarse filter. The alum thus added is not left in the water, but is removed by the filtration, for its active constituent, the aluminic sulphate, is decomposed and precipitated by the action of the dissolved bicarbonate of lime. This should be well understood, although if a minute amount of alum were left in the water its effects would not be noticeable, and even if present in larger amounts, it would not be at all dangerous. The method of filtration is simple in the extreme. An oil bottle or any long, narrow-necked bottle serves for the filter. Tie around it a string soaked in kerosene, about half an inch from the bottom, set the string on fire, and hold the bottle bottom up. When the string is burnt out, the bottom of the bottle is thrust into cold water. If properly done, this causes the bottom of the bottle to split off evenly. The rim of the glass should now be burred off a little with a round file to remove any sharp edges that may be left. The bottle is then thoroughly cleaned and placed neck downward in a convenient support, as, for instance, through a hole bored in a shelf, or it may be allowed to stand in a wide-mouthed bottle, resting by its shoulders on the rim of the mouth. A small handful of cotton wool is now thoroughly wetted by squeezing it in water, and shreds of it are dropped into the bottle until a layer of about two inches deep has been made. The shreds should be dropped in carefully, so as to distribute them evenly, and not to let them pile up in the middle or at the sides. When enough cotton has been dropped in, a cup or two of water is poured in and the bottle gently tapped. This consolidates the mass and finishes the making of the filter-bed. The amount of alum needed to coagulate the water sufficiently for filtering need not, as a rule, exceed two grains to the gallon, and in many instances may be less, but in certain cases of very dirty waters, such as that of the Mississippi River, the amount of alum may be increased to four or even six grains per gallon. The alum is best kept in a solution of such a strength that a teaspoonful of it will contain a grain. To save trouble, the following prescription will enable one to get enough of the solution put up at any apothecary's to last for a considerable time:

R. Alum........................ gr. 128
Aquæ dist.................... ℥ xvi.
M. ft. solutio.

I may add that the expense of this prescription, including the bottle, should not exceed fifteen cents.

The treatment and filtration of the water is best done as follows: A gallon of water is placed in a clean tin pail and two teaspoonfuls of the alum solution are added. It will save time to make, once for all, scratches on the inside of the pail, showing the height of one, two or more gallons of water. It is then well stirred and mixed with a clean tin dipper. It is best to keep this pail and dipper for this use alone. They should be kept scrupulously clean and frequently well scoured with sapolio or a similar kind of soap. After mixing, the water is allowed to stand five or ten minutes, and then poured, by means of the dipper, into the filter. It will run through rapidly if the filter-bed has been properly made, and will be as clear as crystal, and not seldom will form an astonishing contrast with the original water. The first half pint of the water passing through should be rejected. The filtered water may be caught in a pitcher or in any other convenient receptacle. A filter-bed will last a day, but it is not advisable to use it longer. Each day the used filter-bed should be thrown away and a fresh one prepared. The method may, of course, be applied to any of the many filters in use, by simply adding to the water to be filtered one or two grains of alum to the gallon. It will be a poor filter, indeed, that will not filter clear after this addition. Of late, attention has been directed to the latent dangers in ice. It has been found that this apparently harmless and attractive substance may fairly reek with disease germs and filth of all kinds. Unless it is known from whence the ice comes, its use may be more dangerous than the use of water. Ice is sometimes derived from water which no one would think of drinking, as, for instance, from ponds in cemeteries and from rivers in the neighborhood of sewer outlets, and as a result may be indescribably foul. Aside from the danger of germs lurking in ice, there is risk in the indiscreet use of water cooled to an abnormally low temperature, since functional disorders are often caused by the drinking of very cold water. No water is so refreshing as that of a mountain spring, and one reason of this is that its temperature is just right. It is well to take hints that are given by nature, and the hint that the best temperature of drinking water is about fifty degrees Fahrenheit is a good one, and worth following. I would suggest—and I am sure that every one who tries it will be more than satisfied—that the filtered

water be caught in stoppered carafes, or, what is just as good, carefully cleaned sherry bottles stoppered with new, clean corks, and that these bottles filled with water and carefully stoppered be placed in the refrigerator for several hours. By putting half a dozen such bottles filled with water in the refrigerator and replacing them with others as they are taken out, a supply of clean, filtered water of a satisfactory and safe degree of coolness may be kept continually on hand.

The use of this simple method of purification of water will, I am certain, prevent many a case of sickness and not a few deaths, and it is so simple, cheap and efficacious that any one can make a success of it.—*Prof. P. T. Austen in Scientific American.*

HINDOO WOMEN.—The Nizam of Hyderabad is about to appoint woman Commissioners to take testimony in the harems. They must possess a knowledge of law and of the Urdu, Persian, Arabic, and English languages. They will receive a handsome salary and a guarantee of employment for a term of years.

MATHEMATICAL SIGNS.—The sign of addition is derived from the initial letter of the word "plus." In making the capital letter it was made more and more carelessly until the top part of the p was placed near the centre, hence the plus sign was finally reached. The sign of subtraction was derived from the word "minus." The word was first contracted to m n s, with a horizontal line above to indicate the contraction, then at last the letters were omitted altogether, leaving the short line —. The multiplication sign was obtained by changing the plus sign into the letter X. This was done because multiplication is but a shorter form of addition. Division was formerly indicated by placing the dividend above the horizontal line and the divisor below. In order to save space in printing, the dividend was placed to the left and the divisor to the right, with a simple dot in place of each. The radical sign was derived from the initial letter of the word "radix." The sign of equality was first used in 1557 by a sharp mathematician, who substituted it to avoid repeating "equal to."

A PROPHECY.—The *Electrical Engineer* makes the following extraordinary statement: "Nothing in the future appears more probable than that within the lifetime of persons now living the industrial supremacy of Great Britain will pass away with the exhaustion of her coal fields. Switzerland, Italy and the Scandinavian peninsula are destined to become the great manufacturing districts of Europe. This extraordinary industrial revolution will be brought about by the transmission and distribution, by electrical means, of the inexhaustible and permanent water power in those countries. More than a year ago, in Switzerland, a woolen manufactory of 36,000 spindles, with the usual complement of auxiliary machinery, was operated wholly by electric power conveyed from a distant stream, deriving its never-failing supply of water from the melting of Alpine snows. In the new era the Swiss republic may not improbably become the foremost industrial nation of Europe."

TRANSPLANTING POT.—A valuable addition to the working outfit of a gardener is a new transplanting pot made in three parts, the body being divisible and the bottom removable. In transplanting, the bottom is removed from the body, the pot inserted in a hole in the ground, and the keys which control the grip of the side pieces are withdrawn, when the valves are pressed laterally apart and raised from the earth, leaving the earth and plant it had contained in the new location.

BUSINESS NOTES.

ABOUT PEARLINE.

Every one knows about Pearline, almost every one uses Pearline, but we wonder if all the housekeepers who use it know half that can be done with it. We wonder if they all know what some of the bright ones have discovered, that those mountains of dishwashing—the greasy pan and kettle—may be reduced to mole hills of the smallest size by the judicious use of Pearline Fill the roasting pan, as soon as the gravy is poured from it, with cold water, shake in a little Pearline and set on the stove. By the time the rest of the dishes are washed, all the grease is dissolved and the pan can be washed as easily as a plate. Treat the kettle in which anything greasy has been boiled in the same way, and beside clean utensils you will have a clean sink, the use of the Pearline rendering it safe to pour such dishwater into it. Sinks regularly treated to a bath of Pearline and scalding water will seldom need the services of a plumber.

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CONTENTS.

CAUCASIAN vs. CHINESE.

The white laundrymen and women of this city, who, judging by the published names are mostly from the Emerald Isle and Germany, have lately entered a vehement protest against Chinese laundries, principally on the ground that the Chinese are foreigners. Of course, under our laws they cannot be naturalized, and, therefore, having no votes, they cannot expect to receive much consideration from our local rulers, most of whom are also foreigners by birth. Chinese competition, backed by industry, economy and strict attention to business, has been too much for the Caucasian laundrymen, and to save themselves from going under, the latter are now making a desperate effort to drive the Chinamen out of the business. Judging from the newspaper accounts of their plans, the white laundrymen are not over particular as to the legality or morality of the methods to be employed in driving the Chinese out. The National Master Laundrymen's Association have raised a large sum of money to use for this purpose, and their president says they will disseminate literature, bringing the facts before the eastern people that are so well known to those on the Pacific Coast, and keep the agitation up until every Chinaman is driven out of the United States. It is very funny to see one lot of foreigners conspiring to drive out another lot from this free land, which is supposed to be open to all who will behave themselves and work. When it comes to the question which of these foreigners behave the best, which are the most industrious and orderly, the Chinese will win every time. The evils which the inhabitants of the Pacific Coast charge against the Chinese are evils inherent to badly executed laws and venal officials. If the Chinatown of San Francisco were located in New York City, our police officials would quickly bring it to obedience to law, and that is not saying much for the New York police either. They certainly could not be bribed to leave such a plaguespot as Chinatown in New York. The talk of this laundrymen's association about the evils of Chinese immigration is too flimsy a cloak for their real purpose of getting rid of strong competition in business. The American people are too great lovers of justice to be bamboozled in any such way into taking their trade from the Chinese merely to give it to another lot of foreigners. This is a free country, and every one will have his laundry-work done where it will be best done. The Chinese have been wise enough so far to treat these vaporings with silent contempt. The white laundrymen must get up some better scheme. We will tell them of a way in which they can rid themselves of a great deal of competition, not only Chinese but white, and if they will follow our advice we will guarantee them success without their expending one cent of their corruption fund. Let those laundrymen who want to get the laundry-work as a monopoly, wash clean the clothes entrusted them in good soap and very hot water, without the addition of fabric destroying chemicals; let them rinse them clean of all dirt and disease germs by changing the water often enough to effect this, instead of averaging up the dirt and germs among all the different people's clothes entrusted them, and let them dry the clothes as washed in a properly ventilated drying-room, or what is better, in the open air, and those who do these things, which Chinese laundrymen notably do not, will get the entire trade. This advice is given gratis, but it differs from free advice generally in being good.

BANK NOTE CONTAGION.

We have on a number of occasions called attention to the probability of the books in circulating libraries serving as transmitters of disease. Of similar import, though in a smaller degree, is the suggestion we read recently in a medical journal that it would be interesting to ascertain if it were possible to arrive at the information in any way, what influence the handling of bank notes has in spreading disease. Certainly it is within the range of the possibilities that some morbific agencies may operate through this channel in this country, during the protracted existence of some of the issues of our national currency, before their decay and annihilation. The short life of some of the English bank notes is worthy of remark in this connection. We have lately read that an advantage which the English teller possesses over the American and Scotch teller lies in the fact that he issues clean notes only. The Bank of England has the exclusive privilege of note issues in London and within a radius of sixty miles, a right conferred for a certain valuable consideration granted to the Government in years gone by. All the notes received by the London teller are sent to the Bank of England, and they are not re-issued. The average life of a five-pound sterling bank note is two or three weeks, that of a one-hundred-pound sterling bank note three days—that is, the interval between its issue and return to the bank and final death.

FREE TRADE ILLUSTRATED.

Judging from the subjoined editorial from the *People*, a newspaper published in the city of London, the inhabitants of Great Britain are far from unanimous in their estimation of the advantages of free trade in its relation to domestic industries. The article purports to be an extract from the diary of a free-trader, and reads as follows: "Yesterday morning I rose early; my hot water was brought in a Belgian zinc jug, and as is my wont, I worked half an hour in my garden with a Belgian fork and an American hoe. I then took off my French boots, put on a pair of Algerian slippers, and went in to breakfast, which consisted of bread made from Odessa wheat; Normandy butter; American bacon; Mocha coffee; and a few thin slices of German sausage as a relish. Comparing my Geneva watch with the American clock, I found it was time to set forth; so I put some American tobacco into a French pipe, and having lighted it with a Swedish match, I went to the railway station with its Belgian iron frame work, from which a German engine drew me to the city over rails made in Belgium. Here I worked for four hours with an American stylographic pen, and then went to luncheon. American wheat bread; butterine from Canada; Australian mutton; Swiss cheese; and Vienna beer. The knifes were American, and the waiter was a Swiss. I consoled myself with an Havana cigarette, and continued my toil. At seven I prepared for dinner by drinking half a glass of Spanish sherry with Dutch bitters. My dinner was made up of Portugal oysters and Chablis; consommé soup (which came in a powder from France); tinned entrées (from the same country); American beef; Italian cheese; and French wine. A trifle of Chartreuse and a Manilla cheroot followed, and a cup of East India coffee brightened me for my journey home. Here I found my wife playing German music on a French piano, with a French shade on the lamp. I took out my Italian violoncello, and having applied some fine French resin to my new Leipsic bow, played for some time with her. Abruptly breaking off, I told her my adventures during the day in much the same language as above. She grew excited (being a *Fair* Trader), and assured me that though men might have

such experiences, the case was different with women I replied with reminding her that she got her bonnets, gloves, boots, and most of her clothes from France (I spare you the details), her hair from Russia, and her teeth from America. She finally scolded me in German. I retorted in Portuguese, and then seizing my hat and Malacca cane, I left the house, and spent the rest of the evening at the French plays, going home in an American tram-car, and sleeping on a French bedstead."

A DEPARTMENTAL MUSHROOM.

The Washington correspondent of the Boston *Transcript* calls attention to the interesting manner in which the Census Bureau has recently, like a mushroom, sprung up suddenly from apparent nothingness into gigantic proportions. The public, perhaps, are not generally aware that when Mr. Porter was appointed superintendent, a few months ago, it was represented by a single individual, known in the Interior Department as the "census clerk." Within a few weeks from now it will have two thousand employees in its offices here and 45,000 men in the field, not counting the thousands of special agents. It will spend on paper and printing, $700,000, and for other expenses nearly $6,000,000 more—for it costs about ten cents a head, for every man, woman and child, to take the census of a people. Finally, it will publish twenty-five volumes, and then, like a mushroom, it will go out of existence, leaving not a trace behind, save one solitary census clerk sitting at a desk in the Department of the Interior, until the year 1900 shall arise and another census shall be in order. Then the mushroom will sprout again."

USE OF BOARDS OF HEALTH.

At a sanitary convention recently held in Vicksburg, Mich., under the auspices of the State Board of Health, a physician named Baker read a carefully prepared paper embodying the statistics of the work effected in that State by the Board in question, which he summed up as follows: "The record of the great saving of human life and health in Michigan in recent years is one to which, it seems to me, the State and local boards of health in Michigan can justly 'point with pride.' It is a record of the saving of over one hundred lives per year from smallpox, four hundred lives per year saved from death by scarlet fever, and nearly six hundred lives per year saved from death by diphtheria—an aggregate of eleven hundred lives per year, or three lives per day saved from these three diseases. This is a record which we ask to have examined, and which we are willing to have compared with that of the man who 'made two blades of grass grow where only one grew before.'" It shows what scientific sanitation, under well devised and strictly carried out sanitary laws, can accomplish, and the example cited can be profitably followed in other States.

SCIENCE AND INVENTION.

HOW SOME WONDERFUL DISCOVERIES AND INVENTIONS HAVE BEEN MADE.

Dwellers by the sea have noticed for ages that their window panes grow dull by the sand blown against them. Gen. B. C. Tilghman, of Philadelphia, about twenty years ago was the first to see how much this familiar fact meant. He thought that if a little sand lightly blown against glass cuts its surface, the operation could be reduced from years to minutes if a great deal of sand were blown against the glass by pressure. His experiments proved his surmise to be true, and now in hundreds of factories throughout the country the sand blast is busy not only cutting glass for ornamental purposes, but shaping glass for builders and finishing files of hard steel for tool shops. When one strikes a common sulphur match the phosphorus burns with a purplish flame, then the sulphur with a yellow hue, and last of all the wood glows with reddish rays. From noticing that every substance yields its own peculiar color in burning, Sir John Herschel long ago suggested that these colors might serve to identify the substances showing them. Some time after he threw out the suggestion, the spectroscope was devised, and now by its aid we are able to tell what elements are aglow, not only in the sun but in the stars as well. One way of inventing would thus consist in careful observation, and in thinking out all that an observed fact may signify.

That oil repels water would not seem to be a very promising fact for an inventor to begin with. Yet it enabled Senefelder to give the world lithography. He found that writing executed in oily ink could be transferred to stone so that he could print from the impression. When ink from a roller was applied to it the oily lines received the ink; as all the rest of the stone was washed with water, the ink lodged nowhere else. Several beautiful printing processes based on photography depend on a principle as simple as Senefelder's—namely, that certain gelatine compounds are rendered insoluble by the action of light. A picture taken on a compound of this kind is carefully washed, leaving in relief every line on which light has fallen; from this it is easy to take electrotypes for use on an ordinary printing press. Selenium is a comparatively rare mineral with the exceedingly curious property that the electric current it conveys is most sensitive to the play of light on the mineral. By employing selenium in his photophone, Prof. Andrew Graham Bell achieved the wonder. derful result of sending an audible message with no other messenger than the solar beam. Among the most valuable substances known in the arts are the metallic alloys. It has been recently discovered that strong as steel is, it can be made yet stronger by an alloy of 3 to 5 per cent. of nickel. This means that in the future we can have larger bridges, higher towers, and lighter machinery than ever. Ship owners and the passengers as well, have had no small cause of anxiety in the susceptibility to magnetism of the iron so largely used in shipbuilding. It would seem that the chief source of error in compasses may soon be removed, as it is found that a little manganese alloyed with iron produces a metal with scarcely any capacity at all for magnetism. Both iron and steel are now secured against another old foe of theirs, rust, by an ingenious process which coats them with a magnetic oxide of iron. Copper has a remarkable aptitude for combining with other substances, and the alloys thus formed are among the most valuable known. Brass, bronze and bell metal, have been inherited from remote antiquity; of late years manganese, aluminum, silicon and phosphor-bronzes have been manufactured, each possessing singular qualities of strength and beauty. What determines the character of an alloy seems as much a mystery as what decides the properties of any other chemical compound. The properties of table salt do not seem to reside in either the suffocating gas, chlorine, nor the highly inflammable metal, sodium, which go to build it up; and who, before experiment, could have said that a little phosphorus added to iron would greatly increase its liquidity in the molton state, and also materially reduce its tenacity? Or that a trifle of arsenic added to copper would much affect its conductivity? Or that an alloy of lead, tin, and bismuth would melt at a much lower temperature than any one of these metals by itself?

This easy fusibility of certain alloys has been made the principle of a wide variety of automatic appliances promoting safety in case of fire—sprinklers and the like. A good many factories and warehouses throughout the country are now provided with elevator hatches, doors and shutters, which by means of rods of fusible metals close of themselves when fire breaks out. In observatories the changes of temperature, of direction and force of winds, of atmospheric electricity and magnetism are automatically recorded. The apparatus is photographic. A ray of light prints on sensitive paper controlled by clockwork every movement of the instruments. The sensitiveness of electrical apparatus to changes of temperature has been employed not only in constructing automatic fire alarms, but also to give notice on shipboard of the approach of icebergs. Electrical appliances can be used to register and give notice not only of changes of temperature, but also of variations in light, sound and every other form of force, and this in degrees of the utmost minuteness. Indeed, so sensitive is Prof. Bell's photophone to changes in the intensity of light that he can find no artificial source of illumination which does not create a continuous noise in it. Since the approach of an ironclad ship can be clearly indicated by a delicate electrical appliance, a range-finder has been added to the resources of the United States Navy, whereby its gunners can correctly fire at a ship they cannot see. Photography to-day performs automatically a thousand services for us which a century ago were the laborious toil of draughtsmen and artists. It does yet more. In cameras of the instantaneous pattern we are now able to catch pictures of birds in the act of flight, horses as they trot or gallop—pictures which show art that many of its conventional attitudes are false. What were considered mere grotesques in the art of Japan in its representations of animals in active motion, are now found to be due simply to more careful observation than that of the Western world. Draughtsmen, in enlarging, reducing, and copying plans of bridges and buildings, find photography a great labor saver. A new economizer of time, of much narrower applicability, however, has been given them in the polar planimeter. This most ingenious device automatically registers the area of any figure whatever, if a tiny wheel be rolled along its edge.

It is only of recent years that inventors have begun to understand the full meaning of the old proverb that "It is a poor rule that will not work both ways." A turbine wheel is much the best device whereby to derive power from a head of water. A turbine wheel reversed in motion is one of the most efficient water lifters an engineer can use. Gramme, a Frenchman, invented what is perhaps the best dynamo for obtaining electricity from mechanical power. His dynamo reversed is a capital means of getting mechanical power from a current. One of the first applications of powerful electrical currents was to decompose water into oxygen and hydrogen gases. In the battery which goes by his name, Mr. Grove succeeded in deriving a strong current of electricity from oxygen and hydrogen recombining to form water. Chemists are able to build up sugar and alcohol from simpler substances, and, more remarkable still, can artificially manufacture the coloring matters which give indigo and madder their value. Were they able to imitate Nature's more intricate processes, we might be clothed and fed without having to wait upon the slow methods of wheat and cotton fields. That imitation might perchance learn as much from decomposition, from Nature's plans of taking her structures apart, as from study of how she puts her particles together when she forms the kernel of wheat or the fibre of cotton. Within the past year in New York and other

large cities of the Union, street cars have made their appearance propelled by storage batteries. At headquarters how a rule can be made to work both ways is illustrated in an interesting way. The storage battery, in its journey through the streets, "runs down," that is, its metal is gradually dissolved in an acid bath, yielding the current which drives the car wheels. When it arrives at headquarters the metal is redeposited from the solution, just as in an electro-plating establishment, by a powerful current derived from a dynamo.

A task very commonly undertaken by an inventor is to save some waste which he observes. Not seldom he sees very serious waste where nobody else suspects it. An ingenious man with a pair of sharp eyes one day watched a rock-drill at work. The tool was boring the rock much as an auger makes its way through a plank —by cutting out the whole width of a circle. It occurred to him that it would save much power to cut simply a narrow ring instead of a whole circle's breadth, breaking out and removing the cores of rock at suitable intervals. His idea proved successful, especially when black diamonds were introduced for the cutting edges of his drill. Much in the same way Mr. Thomson, of Lynn, greatly economizes heat by confining it in welding to the surfaces to be united, employing for the purpose electricity as a source of high temperature. Mr. Cowles, of Cleveland, by use of heat from similar sources can fuse the ingredients for his bronzes with the least possible waste. To confine heat where it can do work is the intent in using non-conducting felt and gypsum to cover boilers and steam pipes. It would perhaps seem that we should long ago have had cook stoves covered in this way, so that meats might be roasted without roasting the cook. Yet it remained for Mr. Edward Atkinson, the well-known political economist, recently, to construct a cooker with non-conducting walls, at once saving heat and securing comfort to the cook. A very notable example of the efficiency of non-conductors is given us in the Atlantic cable. The electric current finds it easier to go through the copper core all the way from Ireland to America than to escape through a single inch of gutta percha.

In the working of metals and metallic ores a great saving of heat has followed from introducing heated air instead of cold air into the furnace. At first fuel was used to do this, but now part of the heat which was once all sent up the chimney is made serviceable. If with cold air the temperature of a furnace is at 3,500 degs. Fahr., and the melting point of the iron exposed to it is 2,800 degs., it is clear that only the excess of heat beyond this latter temperature—700 degs., or one-fifth—is really doing work. Now, if with hot air the temperature of the furnace increases to 4,200 degs. then its efficiency at once increases to one-third—the difference between 2,800 degs. and 4,200 degs. Oxygen, the only ingredient of the atmosphere which supports combustion, is held in the nitrogen of the air by a very feeble bond. If no waste attended the process the power contained in thirteen ounces of anthracite would separate from air oxygen enough to consume a ton of coal. Not only would an exceedingly high temperature result from using oxygen instead of air in a furnace, with the economy which that would carry with it, but a vast saving would result in the absence of nitrogen, which now uselessly abstracts so much from the volume as well as the intensity of the furnace's heat. Clerk Maxwell suggested that oxygen might be separated from air by centrifugal force, somewhat as cream is driven out of milk in the Danish machines. One difficulty, however, in using oxygen for combustion would be in finding materials for a furnace refractory enough to withstand its extreme temperature.

Many people when listening at a telephone require to press the ear closely to the instrument; as short a distance as an eighth of an inch makes all the difference between hearing and missing a message. And this while the speaker's voice in the room where he is talking may be distinctly heard at a distance of twenty feet. The aerial sphere audibly agitated by the telephonic disk may therefore be but a millionth of that set in motion by the whole of the speaker's voice. This shows us within what wide limits we can hear; quite as wide do we find the limits of seeing. When the moon is at full anybody with good eyesight can read fairly large print, he can do no more in sunlight, although its intensity is 800,000 to 1 in comparison. Feeble therefore as the effort of speech may be, we can still hear a minute fraction of it through the telephone; and despite the friction of disks and the resistance of wax we cannot only commit speech to the phonograph, but recover it with a fair degree of its recognizable tones.

A great many ingenious devices owe their origin to taking some old familiar appliance or process and making it serve a new purpose. Scarcely any invention is commoner than a pendulum clock, and from one of its parts a Yankee inventor has developed a scale much more sensitive than the best knife edge balance. If we examine the wire road by which a pendulum hangs we will find the upper end, where it is fastened to the clock frame, flattened into the form of a spring As a spring, the metal sways to and fro with the very minimum of friction. Suspending the horizontal rod of his balance from just such a spring, Mr. Emery has been able not only to construct an exquisitely sensitive scale, measuring one part in 2,350,000, but also to build a testing machine in which steel bars are drawn out and broken as easily as if they were candy, in which the force at work is indicated with the utmost nicety. Every key one carries in his pocket is identified with its lock by a series of nicks on its edge. By nicking in the same way the backs of his type a New England inventor has devised what is the best of the typesetters and type distributors. His machine sets type from a keyboard resembling that of a typewriter, each key on depression freeing its individual letter. Distributing is effected automatically by the letters making the circuit of a cylinder, and falling by their identifiying nicks into the compartments of corresponding outline. The late Prof. Silliman of New Haven was once consulted by a manufacturer of Britannia metal ware. His ware, though attractive in appearance, lacked metallic sonority. If that could be conferred his market would be much extended. It occurred at once to Prof. Silliman that careful annealing might give the ware sonority by permitting the particles to arrange themselves without constraint. Experiments proved his idea to be correct. By immersing the articles in an oil bath slowly brought very near their melting point, and then permitting the bath gradually to cool, a high degree of sonority was given the metal. Sometimes a fact of the commonest kind gives an inventor a golden hint. The descent of a maple seed in the air gave the idea of a screw propeller to its inventor. Sometimes even a toy develops into a useful device under a discerning eye and a skilful hand. For years children have been combining geography and play by putting dissected maps together. A method of printing cheap color work is based on the same principle. In giving the map of Europe, Spain is represented by a block of yellow compound the shape of that country, France by a block of red, Switzerland by a block of blue, and so on. All are fitted together and the sheet of paper is thoroughly dampened just as it is applied to take party-colored impression. The combination lock originated in England, where it was regarded little more than a toy; transplanted to America it was perfected by the safe makers and applied to strong boxes, safes, and money vaults innumerable.

Various though the achievements of American ingenuity have been in the past, still greater are likely to be in the future. After all, what is the number of really great American inventions of this generation, the telephone, photophone, and phonograph, in comparison with the number of this teeming nation, counting, as it does, now more than 12,000,000 voters? May we not expect as a more rational kind of education makes its way—an education which trains the eye to see, and the hands to execute as well as the memory to remember words—we shall find nature attacked by invention and discovery with new and surprising successes? No sensible man should for a moment entertain the idea that all the best machines, engines, and processes have now been invented, and that little or nothing of value remains to be added to the resources of art and science. There is much to accomplish when the best steam engines rarely exceed one-twentieth of the working power their fuel really contains; and when synthetic chemistry has but made a bare beginning; when almost the whole of metallurgy may be revolutionized, when by economy of converting heat into electricity, we become able to reduce and treat ores and metals by a current instead of a flame. The simple truth is that every new instrument like the photographic camera, the telephone, the galvanometer, the polariscope, the spectroscope, has relations with every other tool, instrument and process known to art and industry. A new invention so far from in any degree exhausting what remains to be found, but lights up a new horizon for exploration. It is like a new octave in music, which multiplies the musician's possibilities in composition by the whole width of his gamut, or like an extension of the visible spectrum which would enlarge at a bound the whole realm of art and color.—*George Iles, in The Sun.*

HELEN.—Mamma, what is a *casus belli*? Mother—My child, never speak of anything so indelicate. It is the Latin for stomach-ache.—*Life.*

AZURRINO.—M. Fouque, the mineralogist, claims to have discovered in a mixture of silicate of copper and lime the beautiful color "azurrino," the composition of which has long puzzled artists. His tint, he says, is perfectly unchangeable, and is identical with the Alexandrian blue which was known to the Ptolemies and imported into Italy in the first century of the Christian era.

CANCER CURE.—A young physician attached to the Chelsea Hospital for Woman has invented and used, it is said with success, a machine which, in cases of cancer, will direct a current of electricity against a diseased cell strong enough to destroy it and at the same time will not injure a healthy cell. Those that are destroyed are said to turn into a hard substance, that remains without causing the patient any inconvenience.

STATE DINNERS.—A very readable account of President Harrison's first state dinner, in connection with which are given the "Cards of Invitation" of the occasion, with the "Prevailing Fashions of State Dinner Service" and the bill of fair, with an illustration of the White House state dining-room and also one of the president's private dining-room, is given in the March 1st issue of *Good Housekeeping.*

A HEAVY BURDEN.—The public debt of France is estimated at $6,200,000,000, making it the heaviest of any country in Europe. To add to the burden, the expenses for the present year are set down at $700,000,000 and the revenue at only $600,000,000; and the Government has been forced to fund the accumulated deficits in a new loan for $200,000,000. More than one-half of the taxation in France goes to the support of the army and navy, and the poorest peasant has always been willing to pay it; but an annual decrease in revenue, increased taxation and new loans will unquestionably tend to injure the industries of the country.

TO CLEANSE BOOKS.—Grease spots, if old, may be removed from books by applying a solution of varying strength of caustic potash upon the back of the leaf. The printing, which looks somewhat faded after the removal of the spot, may be freshened up by the application of a mixture of one part of muriatic acid and twenty-five parts of water. In a case of fresh grease spots, carbonate of potash (one part to thirty parts of water), chloroform, ether or benzine renders good service. Wax disappears if, after saturating with benzine or turpentine, it is covered with folded blotting paper and a hot flat iron put upon it. Paraffine is removed by boiling water or hot spirits. Ink spots or rust yields to oxalic acid, in combination with hot water; chloride of gold or silver spots to a weak solution of corrosive sublimate or cyanide of potassium. Sealing wax is dissolved by hot spirits and then rubbed off with ossia sepia, india ink is slightly brushed over with oil, and, after twelve hours, saponified salmiac, and particles of color still remaining must be removed with rubber.

THE CENSUS.

HOW THE GOVERNMENT TURNS THE TRUE INWARDNESS OF SOCIETY INSIDE OUT EVERY TEN YEARS.

Not content with discovering the day and place of your birth, the Census will insist upon knowing from what race you are sprung, what your sex is, if any, and where your father and mother were born. Also it will require information as to whether you are married, single, or divorced; how high above the sea level you live, in what great draining-basin you dwell, what the lowest degree of cold may be from which you suffer in the winter, how hot you find it in the summer when the thermometer touches its top notch, and how many other people live with you in your house. As for the house, you will be compelled, under penalty of a fine of $100 to say whether you own it or not—if you do own it, whether or not there is a mortgage on it, and supposing that there is one, the reason why you borrowed the money on the property. The census is much interested in your private affairs, you see, and if you have a farm around the house, you will have to tell similar facts about that, even to the value of the cows and the tools in the barn. All this is merely the beginning and does not touch upon the great subjects of agriculture, manufactures, mining, transportation by land and water both of people and of freight, fisheries, taxation, and so on, all of which will be gone into in the most exhaustive manner, the very processes employed in at least twenty-two of the manufacturing industries, for instance being given with the fullest detail. And yet all this mass of information will eventually be condensed into about twenty-five volumes, which will be entitled the Tenth Census of the United States. The facts in relation to population and vital statistics, upon reaching the Census Bureau here, are all counted by electricity, which does the work almost without assistance. It is estimated that in the compiling of tables the machine employed saves three-fourths of what would otherwise be the labor involved and three-fourths of the time. To begin with there is a little pencil of steel on the end of a metal arm a foot or so long, which is so arranged that you can push the pencil in any direction above a celluloid plate that is full of small round holes just big enough to allow the pencil to be thrust into them. Each of the holes has a letter or figure close by it, to distinguish it from the others. Now the operator inserts a manila-paper card in a holder just back of the movable arm, and taking in his left hand one of the original enumerator's schedules, holds the steel pencil in his right hand and proceeds to business. The name of the person on the schedule is Peter Fish; but that is not worth counting, for Mr. Fish is henceforth to be regarded from the statistical point of view, merely as a unit. He lived in Ward 1, and accordingly the operator jabs the steel pencil down into a little hole marked "1," in one of the divisions of the celluloid plates. Also, he was white, another hole punched; male, another hole; fifty-eight years of age, another hole; born in Germany, another hole; his father likewise, another hole; his mother ditto, another hole; his occupation was that of a laborer, another hole, and he died in January, another hole; of malarial fever, another hole. That is all there is about Mr. Fish; so the card previously inserted is removed from the holder and it is found to be punched with a number of round holes in different places. From that card, with nothing on it or in it but the said holes a practised hand can read about Mr. Fish and his history as easily as from the original schedule; for the position of each hole gives the meaning to be conveyed. But the signification of the holes does not have to be read by human intelligence. Electricity does that and counts the facts recorded by the holes as well. The punched card is laid in the bottom of a tray which has holes in it corresponding to those in the celluloid plate. These holes are filled nearly full with mercury. Above the tray is a horizontal metal plate, which moves up and down as directed. This metal plate has attached to its lower side little metal plungers corresponding in number and position with the holes in the tray beneath. When the metal plate is lowered, the plungers go into the mercury filled holes, and the circuit is completed, the contrivance having an electric battery connected with it, with a separate connection for each hole. But suppose a card is placed in the tray with a dozen holes in it here and there, fitting exactly over the holes to which they correspond in the tray, it is apparent that all the plungers will be stopped by the card save those which find the holes; thus completing only the corresponding circuits. Each of the circuits thus completed connects with a sort of electric clock—a small affair—which counts numbers on its dial instead of hours and minutes. The clocks communicated with give one tick forward apiece, thus noting the fact that one more man, say, was a laborer, born in Germany, died in January, etc. If Mr. Fish's history had been different, other holes would have been originally punched in the card, other clocks would have ticked and the sums finally recorded from the clocks, which cannot make mistakes, would have been slightly altered. Inasmuch as each of the possibly 300 holes has its counting clock attached when the metal plate comes down on the card, nothing can be missed. One clock will count 9999 before it has to be started over again. The sums recorded by the clocks are taken down on paper slips and from them transferred to the tables for publication. Such is the electric method of counting a census.

WALL PAPER.

EVOLUTION OF TASTE IN INTERIOR DECORATION.

The history of wall paper is the history of a century and a half of decorative art, a history of the pre-occupations, the tastes, the crazes and the fashions of civilization. In Paris, where modern wall paper was invented, from 1730 to 1785 the wall papers are simple in color, the designs are Louis XV. and Louis XVI., corresponding with the furniture, imitations of drapery, of cornices, etc, of the times. The set scenes are shepherds and shepherdesses of the Watteau school, or scenes from the popular romances of the day, Marmontel's "Les Incas," and "Paul and Virginia," Turkish scenes, Chinese compositions, etc. With the Revolution, wall paper became stern and classical. Floral draperies were replaced by frigid Roman togas, the consular fasces, the lictors' axe, the liberty cap. The fantastic ornaments of the old *regime* gave place to escutcheons with the words, "Law," "Justice," "Peace." The empire and the restoration produced wall papers to correspond with the painting of the school of David, Horace Vernet and Leopold Robert. Fights between brigands and Roman carbineers, dances on the shore of the Bay of Naples, with a bright blue sky and a pumpkin-colored Vesuvius in the distance. Then with Louis Philippe we come to the Gothic subjects, outcome of Walter Scott's novels, Hugo's "Notre Dame de Paris," and the romantic movement in general, castles by the sea, troubadours, medæval hawking and hunting scenes. Then scenes go out of fashion altogether and there is a return to floral ornament. People have had enough of the battle of Austerlitz, of the history of Psyche, of the races in the Corso at Rome, of a run with the hounds "cross country." For a moment flowers are sufficient, worked in with architectural ornaments, verandas, columns, balustrades, vases, etc. With the second empire the human figure is banished from wall paper, except in a few coarse and cheap comic designs for country inns. After this we arrive at the fac-simile period, imitation lace, imitation velvet, imitation damask, imitation tapestry, and here the word imitation is used in no disparaging sense. The modern wall papers are marvellous productions, whether they have been printed *a la planche*, that is to say, by hand or machine, or by means of cylinders engraved in relief. The most precious tissues of China, of Japan, of Persia, the finest silks and brocades, Genoa velvets, reps, damask, amas, the leathers of Hungary, Portugal, Flanders, the tapestry of the Gobelins, stuffs of all kinds, honeycombed, diaped, plushed, felted, smoothed, brilliant, neat, the touches of gold and silver, even mother-of-pearl, have been imitated to perfection by means of the old process of paper painting, combined with those of stamping, which are daily rendered more delicate, more subtle, more sure. The beauty of the result is such that the material used is indifferent. Provided the wall paper gives the perfect aspect of silk, leather, damask; provided the sensation of these fine productions is not troubled by any apprehension, it matters little whether the thing is real or not. A wall paper imitating silk would be ridiculous if employed to make a lady's dress, but on the wall there is no valid objection to be made against it in spite of what some æsthetic purists may say.

THE STRUGGLE FOR EXISTENCE.

INSTANCES OF NATURE'S WISE PROVISIONS IN THE VEGETABLE KINGDOM.

Even plants have an eye to the main chance, observes the *Youth's Companion*. They are as much devoted to getting on in the world as individuals of our own race are. Nor is there any great difference in the objects which their plans take in. They like comfort and secure it in perfectly legitimate ways. The slyness with which the plant sometimes gives a hint of its wishes manifests a spirit of fun. The spacious leaves of the Victoria regia lie spread out on the still waters of the Amazon. There is no occasion for the plant to develop a tough integument in these leaves. Yet what would take place when the fishes came to the surface, as they often do, in pursuit of prey or to escape when they are themselves pursued? The immense leaves would be punched through and ripped from centre to edge. This mammoth lily protects itself against harm from this source by developing prickles and spines on the under sids of the leaf, so as to deter fish from thrusting their noses against that surface. Plants are blessed with hearty appetites for food and drink. That they may make the most rapid growth it is necessary that this appetite be indulged most freely. Moreover like human beings they are subject to disease as a penalty for over-indulgence. If the leaf, for example drinks too much, even water, its tissues will be ruptured. To guard against this danger each leaf tooth in plants like the saxifrage is furnished with a water gland to provide for the escape of the surplus water.

RUSSIAN CANDY.

SWEETS AND CONFECTIONS FOR THE SUBJECTS OF THE CZAR.

A correspondent of an American journal encountered in Paris recently a leading St. Petersburg manufacturer of confectionery and extracted the following informafrom him on the subject of Russian candy:

"My firm," he said, "was the first to use steam power in Russia in the manufacture of chocolate, and generally to carry out this manufacture on the important scale that it merits. Our machines came chiefly from Paris, and we add to their number each year. Just now we use up in the way of raw material annually, 1,400,000 kilograms of sugar, 400,000 kilos of cocoa, 75,000 kilos of almonds, 260,000 kilos of fruits of all kinds, and 1,800 kilos of vanilla, which we import chiefly from France. These materials leave our factory in the shape of over 2,500,000 kilos of manufactured goods. Our business is divided into three departments. The first is the chocolate department, second the department for the manufacture of fruit jelly, or marmalade, including the specialty known as pastila, and the third is the caramel or bonbon department. The most important is the first department,

for our cholocates are bought all over Russia. We produce an average of 1,500 kilos of chocolate per diem. Several machines, worked with a power of 48 horses, and an army of 280 work people, are employed in this department. Cocoa having of late largely taken the place of coffee in Russia as a breakfast beverage, we pay special attention to its manufacture, and have been able to make quite a leading line of this manufacture. The fruit marmalade or jelly department for the manufacture of what the Russians know as pastila is a very important one. You have no idea of the quantity of confectionery of this kind that is annually consumed in Russia. It may be styled without error the national sweetmeat. In this department also we use nothing but machines instead of manual labor. By their help we are able to produce an average of 2,000 kilos of fruit marmalades per diem (about two tons). The principal fruit used is apples, which we buy in enormous quantities in the autumn in the farms of the provinces of Koursk and Moilew, and which we store up ready for use in huge special store-houses. Our Russian caramels, as you may have noticed, differ considerably from the same class of goods in Paris, for, whereas caramels here are solid throughout, our Russian caramels more resemble the liqueur dragees, containing beneath a thin crust of caramel sugar, a liqueur, which differs according to the nature of the caramel. Each caramel is put in a silver paper, and is retailed in Russia for one cent. Their manufacture is very delicate, and great care is needed. So much of these goods get spoiled in the manufacture, owing to their exceptionably fragile nature, that it is not one of the most profitable of our branches. However, the demand for these sweetmeats, as well as for gum lozenges, etc., is so large that we are obliged to turn out an average of 2,500 per diem. In a business such as ours, you can readily imagine that we use up each year a very large quantity of labels, boxes, fancy cartonnages, etiquettes, and so forth. I may mention that our annual outlay on these goods alone exceeds 75,000 roubles, or about forty thousand dollars. We do not manufacture these goods ourselves, but there are a number of establishments working almost exclusively for us. We make a point of giving our orders for these goods to Russian houses alone, and only to such as employ none but Russian work people. Our chromos, however, we are forced to import, and these we buy chiefly in Germany and in France. Our goods are sold all over Russia, including Siberia, Tachkent, Transcaucasia, and other remote parts of the empire. We also export to a certain extent to foreign countries. With time we hope to find customers for our caramels and our pastila in the States also."

LENTEN FASTING.

SOME OF THE STRANGE CUSTOMS THAT PREVAIL OR HAVE PREVAILED IN LENT.

In the early Christian Church wine was as much forbidden as meat to those who were fasting. Very terrible must have been the ancient days of Holy Week that were classed under the euphonious title of Xerophagy, when the only food allowed was bread and salt, to which, in certain localities only, vegetables were added. The rules concerning Lent varied greatly in different localities for several centuries. A writer in the fifth century mentions that in certain places it lasted only three weeks, in others six, and in some as much as seven. Then there were countries in which the Lenten fast was kept on every day of the week. Sunday was omitted in others, and elsewhere there was no fasting on either that day or Saturday. The Cistercians, who did so much in the Middle Ages for agriculture in England used to fast from the 14th of September until Easter, eating neither meat, fish, nor eggs. To this day in the Roman Catholic Church the fast days vary greatly in different countries and even dioceses, and although its Lent now begins or ends on the same days throughout the world, there is considerable difference in the rules for keeping it in certain localities. Then with regard to Advent, there is some diversity. In the fifth century it was kept as a general fast of forty days, from November 11 till Christmas. This custom has so died out that, although in England and Ireland Roman Catholics are made to fast on the Wednesdays and Fridays in Advent, there is no such rule on the Continent, except in religious houses, and only in some of those. A curious custom prevails in France of allowing a certain water fowl that feeds chiefly on fish to be eaten on days of the year on which other flesh meat is forbidden. We think, however, that many people who have once tasted this particular delicacy will not be likely to avail themselves of the privilege a second time. The most interesting exceptional rule connected with abstinence is one that exists in Spain. It seems that at the time of the Crusades all who contributed a fixed annual sum were dispensed from certain days of abstinence by a Papal Bull, and this dispensation has never been withdrawn. As the fee required has now become a mere trifle through the deterioration in the value of the money (about a couple of shillings), the dispensation has fallen within the reach of most people, and the funds thus accumulated are devoted to charitable purposes. It is interesting to remember that when the rules about fasting were far stricter among Roman Catholics in England than they are now, such a thing as eating flesh during Lent was unheard of, and the fast days at other times being then much more numerous than at present, it was very difficult for those living inland to get any fresh fish caught in the sea, and that the potato, to say nothing of certain other vegetables, had not yet been introduced into this country. Tea and coffee were unknown, as also were tobacco and many other little luxuries which tend to make a day of fasting or abstinence far from intolerable in modern times. Nor should it be forgotten that eggs were not allowed on fast days in the Middle Ages. Cheese, milk and butter were long forbidden. The permission to eat meat at the "one meal" on every day in Lent except Wednesdays and Fridays and the last four days of Holy Week is very modern indeed; nor is it universal. Another modern innovation is the toleration of the custom of taking a little tea or coffee with a few mouthfuls, which are not to count at all, at breakfast time, as well as the "half meal," which, with certain restrictions, is allowed under the title of collation later on in the day.

FRENCH COOKS.

PARIS STILL LEADING THE WORLD IN GOOD COOKERY.

Diderot observed there are two classes of people in our society, doctors and cooks; the first labor to preserve our health, the second to destroy it. And the latter generally succeed. "Madame," said Brillat-Savarin to a hostess with whom he dined, and in his best silk stockings, too, "there is no difference between your cook and the Marchioness de Brinvilier's, save in intention." He regarded both as poisoners. It was only under Henry II. that France commenced to have a distinct school of cookery, but it was during the reign of Louis XV. that the school became classical. In the time of Louis IX. the cook also performed the duties of housemaid and ostler. To-day he is a *chef*, monarch of all he surveys, in the house, as well as the kitchen; on an average, his salary is 1,000 francs a month, and "all found;" he draws up the bill of fare; partly dresses the dining table, as the butler disputes that glory with him. Perhaps in actual work the head cook only prepares the sauces. This explains why he is neither a drinker nor a smoker, if he desires to become a first-class taster. In his functions he has strong *amour propre*. Vatel committed suicide because the turbot did not arrive in time, and Fay quit the service of Wellington because the duke insisted on the dinner being served half an hour before the guests sat down to table. The syndicate of master cooks of Paris counts 4,000 members. There are in London mansions 700 French cooks, for not a little of the social success of a celebrity, the first Napoleon excepted, depends on his cook. Gambetta's popularity in the diplomatic and functionary worlds was due to his cook, Trumpette. It is the restaurant developes the cook; there is the real school of apprenticeship. Before 1789 there were not 100 restaurants in Paris, and the leading ones were renowned for a specialty. The fashion of fixed prices for a dish dates from the occupation of Paris by the allies; the officers insisted on knowing beforehand the extent of the assault to be made on their purse. It was at the same time that the restaurants succeeded in abolishing the privilege which debarred them from making purchases till one hour after the opening of the market, so as to allow housekeepers to pick and choose in the interval. Paris still holds her own for good cookery; the best repasts are not at all to be had in the flash restaurants, but in some of the ancient nooks that time has spared, and where neither your life nor your purse is endangered. The humblest French artizan is a judge of cookery, and will endeavor to secure it as far as his means will allow. It comes to him by nature, like his wit and his taste for art. In the way of food supplies, oysters and truffles are the extras most in demand. At Perigneux a truffle merchant recently filled orders in one day for three tons of the black diamonds. As for oysters they are as essential at a dejeuner as potage is at a dinner. Twelve years ago Paris only consumed 5,000 tons of oysters annually; to satisfy her stomach now 11,000 tons are requisite. Snails are also notably in demand, thanks to dressing them with truffles and anchovy paste. But great adulteration of them takes place. False snails are manufactured with a gimlet kind of machine out of calf's lung, mixing the result with herbs, etc., and filling old shells with the compound. The common garden slug does duty also for the edible and orthodox vine snail. M. Hector France says that in Algeria the Arabs eat grasshoppers raw, but cook butterflies in the oven. In the chartered time laid down for roast birds, sixty minutes suffice for a wild goose, forty for a pheasant, twenty for a quail, a woodcock or a blackbird, and "ten minutes for a robin redbreast."

LONGEVITY AMONG SWANS.—The swan is the longest lived bird, and it is asserted that it has reached the age of 100 years. Knauer, in his work entitled "Naturhistoriker," states that he has seen a falcon that was 162 years old. The following samples are cited as to the longevity of the eagle and vulture: A sea eagle captured in 1715, and already several years of age, died 104 years afterwards, in 1819; a white headed vulture, captured in 1706, died in 1826 in one of the aviaries of Schaenbrunn castle, near Vienna, where it had passed 118 years in captivity.

ESSENCE OF LIGHT.—Coal gas compressed into eight per cent. of its bulk and reduced to a buttery character —except flavor—is the recent invention of an ingenious gentleman. It can be evaporated by turning a stopcock. This portable essence of light will be very useful, independent of its application to army ballooning, in a hundred different ways—on board the steam launch, at picnics, in the country house, in the northern wilds of Scotland, and so on.

WHAT CHEMISTRY ACCOMPLISHED.—A chemist has lately performed a feat of no common order. The explosion and fire at Antwerp reduced to a charred mass a bundle of 1,000 florin Austrian obligations. Without presentation in some identifiable form there could be no payment. The imperilled obligations were given to a chemist, and he succeeded in separating the whole of them and finding out the numbers, and upon his report the money has been paid. Capitalists owe innumerable obligations to science.

EXTRAORDINARY TREE.—One of the most extraordinar of African trees is that known as the baobab. It is almost a forest in itself and serves for a complete sylvan palace on the largest scale. Rarely growing more than seventy feet high, its branches extend horizontally, supported by a trunk which has a girth greater, it is believed, than that of any other known tree. One of these extraordinary trees was found on measurement to be forty feet n diameter. The age of another —counting the concentric rings—was found to be 5,000 years at the very least.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

March.

MEAT.—Beef, mutton, ham, kidneys, liver, venison, sausage, veal.

GAME AND POULTRY.—Grouse, hare, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Bass, cod, eels, carp, catfish, flounder, halibut, herring, lobsters, mackerel, mussels, oysters, perch, pike, rock-fish, salmon, smelt, whitefish, trout.

VEGETABLES.—Artichokes, beans, carrots, celery, garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress.

FRUITS.—Apples, bananas, oranges.

PRACTICAL RECIPES.

FIXED-OVER BEEF.—If there is any cold gravy put it over to boil, but if there is none, make some by putting in a pan a tablespoonful of butter and one of browned flour and a sliced onion, fry for a moment or two then add enough water to make it the proper consistency; slice your meat thin, and grate over it a little nutmeg or lemon rind; add it to the gravy, season with salt, pepper, and when very hot serve.

CHILI CON CARNE.—Boil together for one hour and a half, half can tomatoes or one pint fresh ones, one pint boiling water, one pound steak, broiled and cut into dice, one quarter onion chopped fine and two red Chili peppers; when done beat up one or two eggs with a heaping teaspoonful of flour and a little cold water, thicken the stew with this, season with salt, black and red pepper, and serve.

CHILI COLORADO.—Dry, skin and remove as much of the insides as possible of one dozen red Chili peppers, soak them over night; in the morning simmer them with one can tomatoes or one quart fresh ones, for three or four hours, let stand over night; chop one pound lean beef very fine and add it to the tomatoes in the morning, boil for two hours adding a little water if it seems too dry, pour into a jar, set away in a cool place and it will keep a long time and is a delicious sauce for meats and soups.—*Fort Davis, Texas, March* 5, 1890.

CELERY SAUCE FOR BOILED POULTRY.—Cut the green tops off five or six heads of celery and cut the white part into small bits and boil them till tender in half a pint of water; mix two or three teaspoonfuls flour quite smooth in a little milk, then add half a cupful more milk and stir it into the celery; add a small lump butter and salt to taste let it come to a boil and serve.

EVERY DAY FRUIT CAKE.—Two cupfuls sugar and one cupful butter, two cupfuls sour milk, two cupfuls raisins, five cupfuls flour, teaspoonful baking soda, salt, cinnamon, cloves, citron and wine to taste.

GREEN TOMATO PIE.—Pour boiling water over your tomatoes and let them stand for a few minutes, strip off the skin, slice and lay them in pie plates, sprinkle sugar and a little ginger over each layer, also a little grated lemon peel and lemon juice, cover with a thick crust and bake slowly for an hour.

WHITE CAKE.—Two cupfuls butter, four cupfuls sugar, one cupful sweet milk, whites of twelve eggs, six cupfuls flour, two and a quarter teaspoonfuls Horsford's baking powder, flavor with lemon-juice and rind.

HISTORICAL BLANK.—M. Fallieres, the French Minister of Education, has ordered that all reference to the reign of Henry IV. be omitted from French historical text-books, and that the events of that period be passed over, dots being placed in the book to indicate the omission.

RAILWAY DESK.—An Englishman has invented a desk for the use of persons traveling, the table is fixed in such a way that it remains steady in spite of the swaying of the boat or train.

GREAT COMBINATION.—Captain Charles H. Townshend of New Haven, has invented an instrument, it is said, which combines in one a sexant, a theodolite, a transit, a pelorus and an azimuth circle, and it is useful for celestial and terrestrial triangulations and for civil engineering purposes. Captain Townshend has had the instrument patented for about a year. Several orders for it have been received from the United States Lighthouse and Coast Survey Departments, the United States Engineers' Board and from scientists in America and Europe.

OBSTRUCTING TORPEDO BOATS.—Some English officers have made the interesting experiment of jumping a torpedo boat over a boom; thus proving that a single line of spars is insufficient to defend a harbor from torpedo attacks. The boom was twenty feet long by six feet wide, and was surmounted by spikes calculated to hold the boat fast. The boat dashed at the obstacle at the rate of about twenty knots. Her stem was lifted out of the water almost as high as the boom itself, which was forced to sink, while the boat passed completely over it. Neither cut-water, propeller nor plates of the boat were injured.

SPINNING COTTON STALKS.—According to a recent experiment a valuable and important part of the cotton plant has hitherto been wasted. It occurred to a manufacturer of Helena, Ark., that some use could be made of the cotton stalk, and he sent a quantity of it to a factory to be operated upon in the same manner as flax and hemp. The results were returned to him in the shape of about twenty different grades of fibrous material, from course strands of the stalk to the glossy fibre as soft as silk. A machine to spin the material is now under consideration. Should the claim be substantiated, that the fibre of the stalk is sufficiently strong to make the best of bagging, as well as cloth as fine as linen, the value of the discovery to the cotton growing States is plainly apparent. The extraction of the stalk takes about six hours and is affected by an electric process.

TONSILITIS, OR QUINSY.

The tonsils are frequently the seat of inflammation, and acute tonsilitis, or quinsy, is one of the most common forms of sore throat. This affection is usually induced by cold, but it would appear to arise under other conditions also, such as digestive disturbances, etc. It is said to be more common in persons of rheumatic constitution, and one attack predisposes to others. The symptoms come on somewhat suddenly and sharply, with chill followed by fever, the temperature frequently attaining a high point of elevation. Pain is experienced in the act of swallowing from the outset. The inflammation is usually at first confined to one tonsil, but, on examining the throat, there is seen to be considerable redness and swelling of the whole surrounding mucous membrane, the uvula, soft palate, etc., while a copious secretion accumulates at the parts, and causes much discomfort. The act of swallowing becomes increasingly difficult, and fluids are apt to regurgitate through the nose. Pain is felt along the eustachian tube towards the ear, and there are tenderness and swelling in the neck about the angle of the jaw on the affected side. The voice acquires a peculiar and very characteristic snuffing tone, and there may be some embarrassment to the breathing. In a few days the inflamed tonsil shows signs of suppurating, and an abscess is seen to be bulging forward into the mouth. When this bursts, or is evacuated, speedy relief is obtained, and the patient is soon restored to his usual health. Occasionally, however, the inflammation passes from one tonsil to the other, and a similar experience has to be gone through again. An attack of quinsy rarely lasts beyond a week or ten days, and is not, as a rule, attended with danger to life, although it is said that suffocation has occasionally occurred owing to the bursting of a large tonsular abscess during sleep, and the passage of its contents into the trachea. The treatment for a quinsy is much the same as that for an ordinary catarrh or cold. To soothe the irritated membrane and promote expectoration, Ayer's Cherry Pectoral is the most effective medicine. As constipation frequently accompanies the complaint, Ayer's Pills are the most advisable purgative. To prevent a recurrence of the malady, the system should be thoroughly purified and invigorated by the use of Ayer's Sarsaparilla. For the relief of the local inflammation the frequent employment of warm gargles of milk and water, or glycerine and water, or the inhalation of vapor afford much relief, as do also hot applications to the neck. Some authorities recommend the sucking of ice and the external application of cold compressors, but, on the whole, warmth appears to be the more soothing remedy. When an abscess has formed it may be punctured, but care requires to be observed in doing this that no injury be inflicted on any important blood-vessel. The tonsils are frequently the seat of permanent enlargement (chronic tonsilitis), which may result from frequent attacks of quinsy or may exist independently. They are often seen in delicate young people, and in the case of some at least, denote a strumous tendency. They give trouble from the mechanical impediment they present to swallowing and clear articulation, and when very large they cause the breathing to be more or less noisy at all times, but especially during sleep; while again they may give rise to a measure of deafness. Another and very kindred trouble is called pharyngitis, having its seat in the pharynx, or upper portion of the gullet (seen to a large extent on looking at the back of the mouth). This is frequently a chronic inflammatory condition usually associated with derangements of the digestive apparatus, and sometimes the result of excessive tobacco smoking, especially cigarette smoking. On inspection the mucous membrane is seen to be unduly red and glazed looking, with the enlarged follicles standing out prominently. It produces considerable irritation, cough and discomfort, which may be of long continuance unless subjected to appropriate treatment. This consists, first of all, of the removal of the cause, whether it be indigestion or tobacco smoking, and next, to allay irritation by the use of Ayer's Cherry Pectoral, the very best preparation for the purpose.

BUSINESS NOTES.

DIAMOND CUT DIAMOND.

The traveling salesman for the well-known San Francisco wine house of Arpad Haraszthy & Co., being introduced to some New York would be connoisseurs of fine wines, as a Californian, was severely joked about the alleged inferiority of California wines, resolved to get square on their own ground. So he had them invited to a dinner given by a lady, at a swell caterer's, and supplied only Haraszthy's wines under fancy French names. The dinner went off with the greatest satisfaction, the hostess claiming to have imported a new brand of wine, brought from her guests the loudest praises for her taste. So enthusiastic was one member of the party that next day the hostess received a note from him asking where some of the wine could be procured. The hostess most ingeniously replied that the wine was from California, but whose place it came from she could not tell, though perhaps the Californian, who was at the dinner, could.

The dinner had been given nominally by the husband, and at once to him this friend went, angry at the imposition which had been practiced. The husband, when he heard the story, threatened all sorts of harm to the Californian and sought him at his hotel, but he had gone to Philadelphia. It was threatened that the caterer would be arrested for obtaining money under false pretense, but the caterer's bill was for California wine.

The only harm done so far is an extreme coldness between the husband and his wife, who takes advantage occasionally to taunt him on the keen judgment of his friends on the qualities of wine.

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CONTENTS.

WOOD AS HUMAN FOOD.

The modern achievements of science are sufficiently striking to impress the mind with a sense of wonderment mixed with awe, regarding the possibilities of the future. The schoolboy of to-day is familiar with a range of scientific knowledge extending immeasurably beyond that possessed by the most learned intellects of the last century, and the question suggests itself, if we have progressed so far beyond our predecessors of two or three generations ago, what probable comparison will be instituted by our grandchildren in respect to the relative acquirements of their period and that of our own day. Significant indications of the restless spirit of scientific energy are apparent in the suggestions incessantly springing up of processes for the utilization of common material in new and hitherto undreamed of shapes. One of the latest of these is a proposition for the conversion of wood into a food commodity. The joke respecting cheap board that at once suggests itself is hardly relevant in this instance, inasmuch as the process of transmutation which this new project would involve must in all probability be expensive. Nevertheless it is an unquestioned fact that, in an address delivered lately in Heidelberg by so eminent an authority as Victor Meyer, it was declared that "we may reasonably hope that chemistry will teach us to make the fiber of wood a source of human food." Wood fiber consists essentially of cellulin $C_6H_{10}O_5$. Can this be changed into starch? Starch has exactly the same percentage composition, but, as all are aware, differs greatly from cellulin in its properties, and the nature of its molecule is probably much more complex. Cellulin is of little or no dietetic value, and it is not, like starch, changed in boiling water. It readily gives glucose when treated with strong sulphuric acid, as is seen when cotton-wool, which is practically pure cellulin, is merely immersed in it. Starch gives the same product when boiled with weak acid. The author further quotes the researches of Hellreigel, which demonstrate that certain plants transform atmospheric nitrogen into albumen, and that this process can be developed by suitable treatment. The production, therefore, of starch from cellulin, together with the enforced increase of albumen in plants, would, he concludes, in reality signify the abolition of the bread question. Advocates of the Malthusian theory who have been made miserable by contemplating the impending predominance of hungry human stomachs over the supply of food on the earth, will take fresh heart at this proposition to convert forest trees, and with equal likelihood, grass and straw, into nutritious diet for mankind. Organic chemistry has brought into existence many marvellous synthetic combinations, and we hardly feel disposed to doubt the ultimate accomplishment of anything that can be rationally suggested. But in the instance we have been considering, as in many others we could name, it must be borne in mind that the most fascinating and promising theory cannot always be carried out to practical results.

OATMEAL SNARES.

We have nothing to say at present concerning the numerous vaunted benefits of oatmeal as a food commodity, and, indeed, there can be no doubt that good oatmeal, properly prepared, is of benefit to the human system. But the question arises whether it is not a fact that in our present age of hurry and the desire to do things quickly, many people injure their digestive organs by eating oatmeal not sufficiently cooked, and, therefore, in a condition in which the digestive fluids cannot act upon it, leaving it undigested simply to act as any foreign body would act in the system, as a violent mechanical irritant. We are forced to this conclusion by the now too prevalent advertisements of oatmeal prepared by different manufacturers, and claimed to be so prepared as to enable it to be cooked in from three to five minutes. This is simply an impossibility. These kinds of so-called oatmeals are simply decorticated oats, which before grinding are steamed. This steaming destroys any low organisms that may be in the oats. A little bicarbonate of soda and lime is added to help dissolve the albuminoids, and in some instances diastase to increase the converting power of the starch to sugar, but there is nothing in this process that can, in our opinion, so alter the chemical nature of oats or oatmeal as to make it possible to cook it ready for easy digestion in three or five minutes. Against this snare and delusion we would warn the reader. While thoroughly cooked oatmeal, cooked in the good old-fashioned way, is no doubt a nutritious dish, these deceitful and misleading prepared oatmeals are a constant source of great danger, and, to be on the safe side, avoid them.

THE LOW PRICE OF CORN.

There is much complaint just now about the low price of corn, and political demagogues are making capital by ascribing this unfortunate circumstance to the high rates of railroad transportation, or else to the tariff. One thing is satisfactorily proven and that is that the production of corn was greater than the demand, and consequently corn like every other commodity follows the laws of supply and demand. The truth is that we can supply the world with corn, but the world does not want it, because outside the United States few people use corn for human food, simply because they do not know its qualities or how to prepare it. They need new food stuffs but have not been taught yet that corn is the best that is offered. If instead of wasting money on a corn palace in Sioux City, half the amount had been spent in introducing corn and exhibiting its manifold uses and advantages as a food product at the Paris exhibition, a large and profitable market could have been found for our surplus production. The people who saw the corn palace of Sioux City knew all about corn, and therefore, the only good accomplished, was a little land boom for the benefit of the railroads and real estate speculators. When the United States Commissioner at the Paris Exhibition asked the Western farmers to contribute a comparatively small amount to exhibit corn there, he was ignored. Our corn needs to be thoroughly introduced in Europe, and when it once becomes known there will be no more complaint of over-production or low prices. Let our farmers remember this and act on it, at the first and every future opportunity that offers.

IS INSANITY PREVENTABLE?

In an address by Dr. C. B. Burr, Superintendent of the Eastern Michigan Insane Asylum, read at a recent Sanitary Convention at Pontiac, several very interesting facts were stated which will be of value to the general reader. The speaker holds that insanity being merely an expression more or less profound of perturbation of the brain, has, like disease in general, ultimate causes, and that the careful study of these and the dispelling of the mystery surrounding insanity have

shown the latter to be largely preventable. An exaggerated idea exists as to the part which emotional causes play in the production of mental diseases. Mental disease is frequently the result directly or indirectly of the conditions which impair the general nutrition. Unsanitary surroundings, exposure to the contagion of communicable diseases, labor in ill-ventilated rooms, intemperance and other causes which engender bodily illness are directly responsible for an incredible large percentage of insanity. Ill health, especially tuberculosis, caused ten per cent. and contagious diseases caused three per cent. Much clap trap nonsense has been talked and printed by professional reformers about the effects of intemperance, some asserting that nearly nine-tenths of the cases of insanity were caused by intemperance. Statistics show that from eight to ten per cent. doubtless owe their development to the habitual and intemperate use of alcohol, opium and other narcotics. On the other hand the so-called emotional causes of insanity, as business perplexities, disappointed affections, domestic trouble, grief and anxiety, homesickness, popular errors and delusions and religious excitement, together comprise a total of but twelve per cent. of admissions; while of these about one-third of all patients have their mental troubles ascribed to causes which lead to mental disorder through deprivation of sleep, disorders of appetite and digestion, and other conditions purely physical. The manner in which much mental disorder may be prevented is by following sensible rules of sanitation and habits of life.

ROYAL LIES.

The Royal Baking Powder Company has again resorted to its oft-exposed methods of misquotation and misrepresentation when it advertises that the "government chemist says 'the Royal is undoubtedly the purest and most reliable baking powder offered to the public.'" It does not tell the truth when it claims that the "Royal" uses more highly refined and expensive materials because several other manufacturers use precisely the same grade of cream of tarter and do not use carbonate of ammonia in their baking powders. The use of this ingredient which is now almost exclusively used by the "Royal" is considered very dangerous by the "government chemist" so fondly quoted by the "Royal." Its fling at a competitor about the ingredients used in their baking powder is a boomerang, because, though but a trace of some of these appear in the competitors, the "Royal" contains more of these ingredients, though the competitor has charitably refrained from calling attention to it, probably deeming the well-known presence of ammonia an obstacle to popularity, large enough to keep them from adding a kick to a fallen foe. Alum powders may be bad enough but none are so bad as those baking powders which contain ammonia, and the "Royal" never dared to deny that their claimed superior baking powder contained ammonia. When this source of danger to health is removed from the "Royal" baking powder, they may come in and claim to be heard about healthy baking powders. Until then modesty and self-interest should keep them in a backseat.

A SHIP-LOAD OF BEEF.

The steamer "Kansas," of the Warren Line, carried on the last trip from Boston to England 2,334 quarters of beef in the largest refrigerator box ever erected on a vessel. This beef was received from Chicago on a train of twenty-three refrigerator cars. These refrigerators, costing over $10,600 each, are very thoroughly constructed, and are located upon one or two of the upper between decks. Four men are carried on each steamer to attend to keeping the boxes dry and at the right temperature. Besides the "Kansas," there are fifteen other steamers similarly fitted up. This business is all done by the celebrated firm of Swift & Co., of Chicago; and if it increases much more, as it doubtless will, the old song of "The Roast Beef of Old England" will soon have to be changed to "The Good Old Chicago Meat."

COCOA.

The Dutch cocoas still have hard work in trying to gain a foothold in this country. They will never succeed. Their only chance of success requires impossible things to be done to obtain it. They must improve the quality of their goods, which they cannot do under their present process, the price must be reduced one half which cannot be done because of the heavy duty, and they must learn to tell the truth in their advertising. This last is hardest of all, because if they told the truth no one would buy their goods. If by any possibility they should do all that we have suggested, they would then only be on an even competition with our best American manufacturers.

IMAGINATION AND HYGIENE.

WHOLESOME STIMULATING INFLUENCE OF A WELL-GUIDED IMAGINATION.

The contributions of medical men to the departments of imaginative work have been far from insignificant. Several eminent members of the profession might be named who have found leisure, amidst absorbing occupation, so to use the pencil and brush as to gratify not only their private circles but the public, and a list of medical poets would be a long and goodly one, including such names as Akenside (the gifted singer of the pleasures of that imagination whose usefulness I am attempting to extol), Garth, Blackmore, Goldsmith, Smollet, Armstrong, Erasmus, Darwin, Crabbe, Moir (better known as Delta, John Brown, whose "Rab and His Friends" is idyllic), and Oliver Wendell Holmes. Nay, even one or two of the greatest names in poetical literature might not improperly be added to such a list. Keats was apprenticed to a surgeon at Edmonton, and afterwards attended St. Thomas' Hospital. It has been argued, I am afraid not very convincingly, that Shakespeare's extensive medical knowledge proves him to have been engaged in the study of medicine during one or two of those years that are unaccounted for, but it is indisputable that Dante was enrolled amongst the *medici e speziali* (leeches and druggists) of Florence, and that he attended their council meetings for several years. But it is not as producers but as consumers of poetry and imaginative literature that medical men derive from them their restorative influence, and as consumers they are, I feel sure amongst the bookseller's best friends. Sydenham, when asked by Sir Richard Blackmore what course of study he would recommend for a medical student, replied, "Let him read 'Don Quixote,' it is a very good book; I read it still." Connolly, the apostle of that non-restraint system to which we owe everything that is most excellent in the treatment of the insane in this country, and with which I trust professional opinion and public sentiment will permit no tampering—Connolly told me in his latter years that he took ever renewed delight in "Gulliver's Travels." I know hard-working doctors in town and country who hold habitual converse with some of our great imaginative writers. Two of the most distinguished and busiest physicians of this day are, to my knowledge, inveterate novel readers. I have heard one of our great surgeons deliver an address betraying a deep study of the poetry of Keats; and another of our great surgeons, present at this meeting, told me recently that on his way to and from every serious operation he dips into Shelley. But it may be objected that the imagination, if sometimes stimulating and restorative in its influence, is often morbid in its tendencies, and that its indulgence is to be guarded against by those who desire to possess well regulated minds. "No habit can be more opposed to a healthy condition of the mental powers," says Abercrombie, "than that which permits the mind to wander in a mere vision or waking dream from scene to scene, unrestrained by reason, probability or truth;" and the answer to Abercrombie is supplied by Tyndall, who says that those who have denounced the imagination because they have seen its disastrous effect on weak vessels, "might with equal justice point to exploded boilers as an argument against the use of steam." But the weak vessels wrecked by imagination are really fewer than is commonly supposed. Now and again some erratic genius of highly strung nervous tempermament, gives himself up to pleasures of imagination till he becomes intoxicated with them, and staggers over the boundary of sanity. Now and again an intensly imaginative child like Jerome Carden or Hartley Coleridge, so indulges in day dreams that his fancies grow to phantoms that haunt him; but I do not hesitate to say that for one case of insanity caused by excess of imagination, there are a dozen caused by want of it. Apathetic dullness and torpor of mind are apt to deepen into dementia; and those entirely given up to "the care of this life and the deceitfulness of riches" are more likely to be choked by them than those who can surmount them, and breathe the free and ample air of æsthetical emotion. A vulgar error as to the nature of insanity has perhaps conduced to exaggeration as to the dangers of imagination. Visitors to asylums invariably arrive expecting to find growths of morbid invention and belief, wild, tangled and luxuriant as a tropical forest, and leave much disappointed by the barrenness of the land, for the insane are the least imaginative of beings. At rare intervals a madman is encountered—a Blake or a Swedenborg—whom two intrepid doctors have certified, who dazzles all around him by the meteoric brilliancy of his conceptions; but, as a rule, the lunatic is as dull as a stone. He is the victim of a fixed idea, or his delusions pursue a threadmill round, or occur in groups so unvarying that, if you have ascertained one of them, you can predict all the rest. His mind is a blank or a blurred and unreadable page, or his fancies, if they come thick in the tumult of mania, are so disjointed or huddled together as to defy recognition. Idiocy is the absolute negation of iminagation, and insanity underminds and destroys or enfeebles it more or less, and when we try to drive out insanity, the first thing we do is to invoke imagination's aid, for moral treatment consists mainly in appeals to this faculty, and fully acknowledges its hygenic uses. The first recorded cure of melancholia was by the harp of David, and to-day in every lunatic hospital worth the name persistent efforts are being made by music, by pictures, by poetry and the drama to stimulate the imagination and thus "cleanse the stuffed bosom of that perilous stuff that weighs upon the heart." Imagina-

tion seems to have a trophic influence on the brain, When it is absent tardy growth goes on; when it is more or less in abeyance, weakness exists; when it is active, there is vigorous development; and the immediate effects of imagination in causing exhilaration and preventing sleep when it is excessively indulged, almost suggest that the states of the cortex which accompany it have some control over metabolic changes in the body. We now know that, besides alkaloids exercising a poisonous effect, which owe their formation to microbes, and are called ptomaines, there are others which are produced by the cells of the living organism themselves in breaking down albuminous matter, which are called leucomaines. Now Bouchard has shown that the alkaloids of the latter kind formed during sleep have a stimulating action, so that when they accumulate to a certain amount, they excite the nerve centres and cause awakening, while those formed during waking hours have a depressing action and tend to induce sleep. And it is just possible that in the formation of leucomanies of differen classes, under varying conditions of the supreme nerve centres, a key may be found to the curious fact that certain emotional moods, after having persisted for a time tend to induce their opposites—excitement, depression; appetite, disgust—and also the influence of imagination, when very active, in causing exhilaration and wakefulness. It is just possible that under such circumstances it may arrest the formation of those leucomaines, usually manufactured during waking hours, which are depressing and lead up to sleep, or so modify decomposition that other leucomaines of a stimulating character are produced. There can be no question that in insanity, certain states of the highest nerve centres are accompanied by rapid disintegration of the tissues and emaciation, while in other states of these centres metabolism is reduced to a minimum, so that prolonged starvation may be sustained with comparatively little wasting. But it is only an inordinate indulgence of the imagination that produces excitement and interferes with natural slumber; its reasonable and regulated use causing only a certain buoyancy of spirits with which a sense of soothing is associated. Imagination, indeed, legitimately used combines to some extent the pleasureable effects of both morphine and caffeine, without any disagreeable after-consequences, such as headaches, despondency or confusion of thought. On the one hand it may heighten happiness, and on the other afford solace in suffering and sorrow. It may give zest to the appetite and allay the pangs of hunger, brace to exertion, or lesson the sense of fatigue. It would not be wrong to speak of it, when rightly used, as a true physiological stimulant, and analgesic, capable in some degree of taking the place of those crude agents drawn from herbs and trees, with which in all quarters of the globe mankind has sought to mitigate the dullness or assuage the pains of life. Moreover, its massive pleasures have a distinctly sedative effect in connection with those petty but exasperating animosities and jealousies that are the thorns of social intercourse, and fret and fray fine-textured brains. Lifting us above the turmoils and worries of the moment and opening up wide and distant prospects, they promote altruistic feeling, lull to rest our wounded sensibilities, and allay feverish excitement.—*Journal Amer. Med. Association.*

NEEDLESS WASTE.

A FEW SUGGESTIONS RELATIVE TO MINOR HOUSEHOLD ECONOMIES.

I have been told by many ladies that they never throw away anything; I have been defied by others to mention anything except dirt which they did not cling to like a rich aunt. Now, to begin: Does any housewife ever throw away crusts and odd pieces of bread, or does she only slip them into a waste basket, when no one is looking? All ye that are liable to be tempted in this way know that crusts carefully saved can be made into griddle cakes, puddings, meat dressings, fish cakes and when dried in the oven and ground up with the rolling-pin they can be used for thickening soups and gravies, or for any other purpose for which rolled crackers are used. The pan of crusts carefully kept will save the measure of meal or crackers, and leave another little coin in the purse to be generous with, or to wear away the barriers of narrow means. You have heard of the lady whose cake disappointed her in the very face of company coming to tea. Did you also hear that she was mad and threw it away! She did nothing of the kind. Instead, she cut it up in slices, made a delicate little custard, brought out her preserves, and triumphantly placed on the table a very palatable charlotte russe. Another lady in relating her martial experiences, said her husband objected to having rhubarb sauce brought to the table more than three times in succession! Of course she threw it away, and, of course he twitted her with being wasteful. Oh, if one had but dared to suggest to the unhappy woman that she might have taken her rhubarb sauce, or any other sauce that chanced to offend by its too great familiarity, and have made of it a nice large tart, wfth fancy twisted bars across the top, and thus she would have mollified the tyrant, man. I wonder if every living housewife knows that apple jelly and vinegar can be made from apple parings? Save the parings in an ice chest till a sufficient quantity accumulates, wash, cover with water, and boil quickly for an hour. Strain through a jelly bag, add half the quantity of white sugar, and boil gently two hours. Flavor with vanilla, and pour into heated glasses. For the vinegar, the parings are put into a jug, a little water is added, and they are allowed to ferment in a warm place behind the stove. Do we throw away old clothes before all use is got out of them, and they are rags? Some do not, more do. With the scientific housewife, the shining robe of state descends in regular gradations till its lowly lot is cast in a comfortable mat beneath the feet. With the less industrious and the immature who are constantly taking their places in the world, clothes are often thrown into the rag-bag before they are half worn out. A child's dress gets short in the sleeves, and in it goes! A skirt shrinks and demands piecing out. The demands, like the demands of an oppressed people, are consigned to oblivion, the oblivion of the rag-bag. Changing fashions condemn many garments to that pit of darkness before their time, and the point at which discussion judges best to take a stand against outside pressure must ever remain an individual matter to decide. While some may overstep the boundary on one side or the other, the woman of reflection will generally do what is best.—*Housewife.*

OILCLOTH.

ITS MATERIAL AND THE PROCESS OF MANUFACTURE.

The body of oilcloth is what is called burlaps, made of jute and imported from Scotland. This coarsely woven fabric is limp, and is stiffened by being passed through a mixture of starch and glue and over hot rollers, coming out, it might be said, laundered. It is then ready for the paint machine, where it is given the body. There are four qualities of oilcloth, depending on the number of body coats of paint. That which is to be the best quality receives five or six coats; the poorer grades a less number. The cloth, in pieces twenty-five yards long by two yards wide, is dried in racks which are constructed in tiers of twenty. The factory has a rack capacity of 11,000 square yards. The thickness of each coat of paint is governed by a steel knife, in manipulating which a workman becomes so proficient that he can tell nearly to a pound what a piece of cloth will weigh when the coating process is completed. Three men at a paint machine can turn out in a day 100 pieces containing fifty square-yards each. The operation of coating the first-quality cloth occupies a week, as each coat requires twenty-four hours in which to dry. It is then sent to the rubbing machine, where surfaces coated with glue and sand pass rapidly over the side which is to be printed, ridding it of all irregularities. The better qualities are afterwards given another coat of paint, when they are ready for the printers. This is the most interesting part of the operation. For every color in the pattern to be transferred to the oilcloth there must be a block. These blocks come from Maine. They are about two inches thick, two feet square, and are composed of several layers of wood. The surface to be used is of maple, crossed and recrossed by narrow grooves, which form a surface of small squares, 144 of them to the square inch. Those squares look like, and are in reality, so many pegs. Where the pattern is desired to show the pegs are left standing, those on the portion of the surface which is not to be printed, from being cut away. The styles in patterns change twice a year. Some are designed in Utica and others come from Philadelphia and New York. Some patterns containing many colors require from twenty-five to thirty blocks, and consequently that number of impressions, to reproduce the design. Rug patterns are the most difficult to make, as it requires different blocks for the corners, sides and the centre. The printing is done on the top floor, so that the oilcloth can hang for a distance of fifty feet to dry. Each printer has a table with eight pads, on which he smears his colors. Pressing a block to the pad containing the required color, he transfers it to the surface of the cloth, using hand pressure only. Having done this with every block, as each transfers but one color, and consequently but a small portion of the complete design, he has finished about four feet square of printing, and goes about repeating the operation on another portion of cloth, and so on. Two men generally work at a table, and can turn out from 100 to 150 square yards of cilcloth a day, when printing seven or eight color patterns. The paint used is similar to the ordinary house paint. When the printing is completed another block is pressed on, which gives the embossed surface, of which there are two kinds, pin and line finish. The wet cloth than hangs from the loft for a week, when by an ingenious mechanism it is transferred to the drying room, where for another week it remains in a temperature of 130 degrees. The door to this dry-room is fifty feet high, allowing that length of oilcloth to be passed through without rolling or bending. Coming out it is varnished, three men with the aid of a machine varnishing 6,000 yards a day. Next it is trimmed and the cloth is ready to be shipped.

PENNY POSTAGE.—A medal has been struck in commemoration of the fiftieth anniversary in England of penny postage.

DECLINE OF VALUES.—In Kent, England, a farm of 500 acres that has been let for $6.000 per year has just been re-let to the same tenant for $2,500. This is said to be a fair illustration of the decline of farm values in England of late years.

EXTENSIVE MENU.—Several well-known men, including some diplomats, made speeches at the opening in Paris recently of a culinary exhibition, and were entertained at a table upon which were set 200 different dishes differently cooked.

LUMINOUS PROJECTILES.—A Russian officer has invented a luminous projectile to be fired from a gun. It is claimed that it will be extremely useful for discovering the movements of an enemy in a naval contest at night.

BREATHING AND THE TEETH.—It may become necessary to add "Breath through the nose" to the rules usually laid down for the preservation of the teeth. A British dentist, Dr. Scanes Spicer, has been struck with the frequency with which carious teeth are associated with nasal obstruction, and he believes that a relation exists between them. Mouth breathing, which in such cases is enforced, may act as a predisposing cause of caries of the teeth in various ways. Exposure to the cold air tends to cause inflammation of the tooth pulp, produces congestion of the mucous membrane and a secretion of stringy acid mucus, and dries the mucus so that it forms a fertile soil for the disease germs.

CORRESPONDENCE.

THE HEAVY END OF THE GLOBE.

LOWELL, MASS., *March*, 6.

Editors AMERICAN ANALYST: In an article on the first page of the ANALYST, February 20th, referring to the hypyothesis that the earth is growing "heavier" at the South Pole, by reason of increased ice-area, and so disturbing the equatorial balance, it says: "The heavier that end of the globe becomes, the more the other end turns up to the sun, with the consequence of leaving the depressed end literally out in the cold, and the colder it is the more the ice accumulates and the heavier the end becomes." Now this is a very pretty theory as it stands; but when we come to consider that the term "heavy" means attraction, of course increased bulk must cause increased attraction, and as the sun is the centre of attraction in our system, the increased bulk of a planetary body means an increased tendency to approach the sun. In other words if the South Pole is growing "heavier" than the North Pole, it (the South Pole) should turn *towards*, and not *from*, the sun, just as it is the "heavy" end of a shuttle-cock that strikes the floor and not the feathered end. So that if it is true (which may be admitted for argument sake) that the inclination of the earth's axis to the plane of its orbit is increasing—becoming more verticle—the increased ice-area must be the consequence and not the cause of the change—having a tendency to retard rather than accelerate the change. It has long been known that our globe, in its journey round the sun, swings from side to side, like a boy's top when it is "asleep," but it takes the earth 25,745 years to swing from one side to the other. This is what is known as the "precession of the equinoxes," first observed by Hipparclus, a century and a half before the Christian era. What is now the Arctic zone, will, sometime, become the tropic, as it had been in the ages when what is now the polar regions were the habital of the mastadon, and possibly (as my learned friend Dr. Warren, of the Boston University conjectures), the birth-place of humanity.

C. HENRY ST. JOHN.

[If our valued correspondent had read the editorial referred to more carefully he might have observed that the passage he quotes was cited by us as the opinion of a particular class of theorists, in comparison with a variety of speculations on the subject—EDS. AM. ANALYST.]

WINE FERMENTATION.

PROF. TYNDALL DESCRIBES GERM LIFE IN WINE AND BEER.

In our own day we find people complacently asking in the newspapers "If rabies be a germ, and if cholera be a germ, when and how did the germ make its first appearance amongst us? It must have had a beginning —when was it?" And if you say you cannot tell, they imagine the question settled. Now here is a microscopic fungus which has been manufacturing alcohol certainly for 2,500 years, and probably for much longer. If, then, you have to look so far back for the earliest germs of brewers' yeast, why should you not look equally far back for the origin of fever germs? Such questions sprang from want of knowledge, and yet they succeed in diverting numbers of people from a knowledge of important truths. In 1680 that marvellous observer, Leenwenhoek, placed yeast under a microscope, and noticed it in minute globules, but beyond that he did not go. In the year 1836 the surprising fact was first made known that yeast, for the most part, was a living organism, and that the foaming of the fermenting tub was due to the growth and multiplication of this organism. In that year Cagniard Latour, in France, and Schwann, in Germany, first made this growth and multiplication clear. Both those observers saw the globules of Leenwenhoek enlarging under their eyes, and throwing out buds which, after separation from the parent, grew and threw out buds in their turn. This little fungus resembles ourselves in one particular - it requires oxygen for its support, as we do; and, like us, it breathes out carbonic acid gas. The bubbles of this gas lifts the packed and entangled cells of the yeast into a kind of foam. What does the fungus feed upon in the brewing vat—when does it get the oxygen necessary to its life? Not from the air, from which it is completely shut off, first by the walls of the vat and then by a layer of heavy carbonic acid gas, which covers it like an impervious blanket. Where, then, does it get its vital oxygen? From the sugar of the wort, which comes primarily from the sugar of the malt. The profession of the maltster consists in the proper development of this sugar from the grains of barley. The yeast fungus failing to get oxygen from the air, turns its forces on the sugar, decomposes it, feeds upon its oxygen, grows and multiplies, and leaves two things behind as the result of its toil. One of the two is carbonic acid, and the other is alcohol. This was a great discovery, and it has proved the germ from which other discoveries have sprung. The wine industry of France is, as you know, of the greatest importance to the nation. It is marvellous what can be done by people without book learning merely by the observation of the facts around them. Wine was manufactured by people guided wholly by empirical observation. They gathered the grapes into vessels, stamped them to a pulp, and by proper processes caused the juice of the grapes to ferment. They did not know the meaning of those processes, but they succeeded in making the wine. Note this fact. If by means of a perfectly clean syringe we draw from a grape its juice, and protect that juice, as Von Recklingshausen protected blood, from dust and dirt, it will not ferment. In like manner, if you extract from the udder of a cow its pure milk without permitting dust or dirt to invade it, it will never become sour —never putrefy. The lactic acid ferment is derived from without; hence the necessity of cleansing our dairies from it and from the ferments of putrefaction. Wine is produced by the same ferment that produces beer. But, while the brewer intentionally plants yeast in his wort, nothing of this kind is done in the manufacture of wine. Whence, then, comes the wine torula? The answer is suggestive. You find the torula as an epiphyte on the surface of the grapes and on the twigs that bear their luscious bunches. Was there ever a sorer temptation set before weak human nature? You have the grape with its internal juice absolutely innocent of alcohol. You have the equally innocent torula at hand outside the grape. Surely the temptation is strong to bring them together, and to produce that stimulating beverage celebrated by poets, and drunk by sages, from the beginning of time. But, in regard to wine, the wonder does not stop here. Wine, treated in a certain manner, becomes vinegar, and vinegar contains no alcohol. The substance to which it owes its acidity is acetic acid. As in the case of lactic and butyric acid, the producer of acetic acid is a living organism. This substance results from the nutrition of an extremely minute organism called *mycoderma aceti*. Every claret drinker is aware of the necessity of keeping the air out of his bottles. Instead of allowing them to stand upright, he lays them down flat to keep the corks from shrinking. If the claret is exposed to the air, or sometimes even when a defective cork has been employed, the wine becomes converted into vinegar, the manufacture of which constitutes one of the great industries of France. It is curious to reflect on the means by which large populations are sometimes maintained. The little organism which converts wine into vinegar, affording in doing so remunerative occupation to the city of Orleans, is of a particularly despicable character. It is extremely small and insignificant looking. Million and trillion-fold it, however, overspreads the wine, feeds upon its constituents, and while thus nourishing its own small life, converts the alcohol of the wine into vinegar. The losses of the wine grower are sometimes very great. Wines of great promise often become bad through no apparent cause. Knowing once for all what these micro-organisms are capable of producing, Pasteur saw clearly that the maladies of wine were caused by organisms other than the torula. He aimed at destroying these organisms without injuring the wine. Fortunately, the particular ferments that alter wine, and injure it, are killed by a comparatively low temperature. Fill a bottle with good claret, cork it well, and bring it for a minute or so to a temperature of 122 deg. Fahr. All its injurious organisms are destroyed. Pasteur assembled the best wine-tasters in Paris, and submitted to them samples of wine which had been treated in his fashion, and of the same wine which had not been thus treated. They were absolutely unable to distinguish between them. This was a conclusive proof that the wine had not been damaged by the heating. Pasteur's method of protecting wine is now used to a vast extent in France, the consequent saving to the nation being immense.

HUMANITY'S NEW EYE.

ASTRONOMY'S INDEBTEDNESS TO THE PHOTOGRAPHIC ART.

Camille Flammarion, whose writings are always readable and instructive, and usually graphic, thus describes, in the Paris *Figaro*, the triumphs of photography as applied to astronomy: This eye, whose visions I have just admired, measures more than a meter in diameter, and fifteen meters in depths. Its crystailine lens is formed of an immense piece of glass, and its retina of a highly sensitive chemical plate. The eye of a giant, in verity, as the man possessing it should measure in our organic proportions 100 metres in height, and he would not be able to pass under the Eiffel Tower without humbly bending. A gigantic eye, possessing four marked advantages over ours: it ses quicker, farther, longer, and, precious faculty, it fixes, prints and preserves what it sees. This new eye is the photographic eye. The principal astronomers of the world have just met at the Paris Observatory in order to decide on its immediate application to a new and complete study of the starry heavens. Magnificent specimens of photographs of the moon, the sun, the stars, the nebulæ, and even of the planets, were presented to the congress, and showed what may be expected from the new processes. Some photographs among them show us the lunar mountains and craters, such as they would be seen at a distance of forty leagues. Yet, this artificial retina sees quicker and better, and by an absolutely different faculty it can penetrate into abysses into which we cannot see, and will never be able to see anything. We have here, perhaps, its most extraordinary feature. Let us place our eye, for example, to the eye-piece of a telescope whose objective has an opening of thirty centimeters. In this telescope of thirty centimeters in diameter we discover stars up to the fourteenth magnitude—that is to say, about 44,000,000 of worlds of all kinds. Now, instead of our eye, let us use the photographic retina. Instantly the most brilliant stars will imprint their image on the plate. Five-thousandths of a second suffice for stars of the first magnitude, one-hundredth of a second for stars of the second magnitude, three-hundredths of a second for those of the third, one-tenth of a second for those of the fourth order, two-tenths for those of the fifth order, and five-tenths of a second for stars of the sixth magnitude. Thus, in less than one second, the photographic eye has seen all that we can perceive with the naked eye. But this is yet nothing. The telescopic stars visible in the instrument will also imprint their image on the plate. Those of the seventh magnitude require one and one-third seconds, those of the eighth magnitude three seconds, those of the ninth magnitude eight seconds, those of the tenth twenty seconds, those of the eleventh magnitude fifty seconds, those of the twelfth require two minutes, those of the thirteenth five minutes, and, finally, those of the four-

teenth thirteen minutes. It follows that, if we have given our plate an exposure of one-quarter of an hour, we will find imprinted on this plate all that portion of the heavens towards which the glass had been directed, and all that that region possesses—all that which with infinite trouble we might have been able to discover, to measure by a series of laborious and very lengthy observations. A sufficient number of instruments pointed so as to embrace the whole of the heavens will fix on an immense chart all that astronomical observers can study, and which could only have been obtained after a lapse of several centuries. But here is only the commencement of the marvelous. Let us allow the photographic eye to look instead of our own; it will penetrate into the unknown. Stars invisible to us become visible to it. At the end of an exposure of thirty-three minutes, the stars of the fifteenth magnitude will have impressed the chemical retina and formed their image. The same instrument which shows to the human eye stars of the fourteenth magnitude, and which in the entire heavens would register about 44,000,000 of stars, shows to the photographic eye 134,000,000 at the first requisition for obtaining the fifteenth magnitude. It would reach the sixteenth at the second requisition in an exposure of one hour and twenty minutes, and throw before the astonished gaze of the beholder a luminous dust of 400,000,000 of stars. Never before, in all the history of humanity, has man possessed the power of penetrating so profoundly into the depths of the infinite. With the new improvements, photography gives us clearly the image of each star, whatever its distance, and fixes it on a document where it may afterwards be studied at leisure. Who knows, if at some future day, in the photographic views of Venus or Mars, a new method of analysis will not enable us to discover the inhabitants!—and its power extends as far as the infinite. Here is a star of the fifteenth, sixteenth, seventeenth magnitude, a sun like our own, at such a distance from us that its light requires thousands, perhaps millions, of years to reach us, notwithstanding its prodigious velocity of 300,000 kilometers in a second; and this sun lies at such a depth that its light, so to speak, does not reach us. The natural eye of man would never have seen it, the human mind would never have guessed its existence, with the instruments of modern optics; and yet this feeble light, coming from so far, is sufficient to impress a chemical plate, which will indelibly preserve its image. And this star might be of the eighteenth, of the twentieth order, and still smaller, so small that never human eyes, assisted even by telescopes of the highest power, will see it; for there will always be stars beyond our vision; and, nevertheless, with its little ethereal arrow it will reach the chemical plate exposed to await its coming and to receive it.

THE LEATHER BOTTLE.

ITS MEMORY PRESERVED IN HISTORY AND LITERATURE.

"*How oft the Black Jack to his lips doth go.*"
—*Simon the Cellarer.*

The idea of employing skins as vessels for holding liquids is as ancient, at all events, as the Hebrew Scriptures, where the hide of the goat is described as applied to this purpose. In Italy and Spain they employ the gourd or calabash, which becomes as hard and impervious as wood; and in the latter country the sherry is brought to market by the peasants in pigs' skins, which communicate a peculiar flavor to the wine. Bottle makers, or manufacturers of leathern *botels*, are mentioned in some proceedings between the Corporation of London and one Nicholas Burle (1 Richard II., A. D. 1378). This Burle was a dealer in hides, and sold them, among other customers, to bottle makers. The contention was raised by certain cordwainers or boot makers, who pleaded that the hides were not only useless to them, but to all other employers of the same material, and two bottle makers, William Karlille and Thomas Tyrold, deposed that the hides were raw and forfeitable, and were unfit for their business and any other alike, so that the goods were declared forfeited. The leather bottle was made in a series of sizes, variously designated, from the *bombard* of one and a half gallons to the pint or half-pint. In the time of Charles I., when Thomas Heywood published his "Dissection of a Drunkard," 1635, the plain bottle is stated to have been chiefly in use among shepherds and country folk; but they had them also mounted in silver in ale-houses, both in the city and suburbs, while at the court there were the black jack and the bombard, which led to the notion of the Frenchman that we drank our wine and beer out of our boots. In the reign of James I., the lieutenant of the Tower was entitled to two bombards of wine out of every ship which came freighted therewith to the Thames. A writer of that day, comparing the bottle and the jack, says:

When the bottle and jack stand together, O fie on't,
The bottle looks like a dwarf to a giant;
Then have we not reason the jacks to choose,
For they will make boots when the bottle mends shoes.

Among the curious tunes formerly in vogue was that of "The Bottle Makers' Delight," and it was to this that we are directed to set "A Song in Praise of the Leather Bottle," published about 1700 on a broad-sheet. The sign of the "Leather Bottle" is still associated with Messrs. Hoares' Bank, in Fleet Street, London, over which it used to be seen suspended. In the play of "Mucedorus," 1598, the clown says that he shall go to Thomas the butler for a jack of beer. In the Serving-Man's Comfort," by J. M., 1598, where the writer is deploring the decline of ancient hospitality, he inquires, among other points: "Where are the great black jacks of double beer?"—showing, as we have said, not only that the leathern vessel, like that of glass, was made of various capacities, but that the jack was probably the next size to the bombard. The late Mr. Thomas Willement, of Davington, Kent, used to show a jack, which was thought by him to have belonged to Oliver Cromwell. But whether it was strictly a jack or a bottle, we cannot determine, as we never saw the relic. No doubt, even after the general introduction of glass and hardware for drinking vessels and liquid measures, the fragility of both led travelers, soldiers, officers on the march, and others who had not much room to accommodate their stores, to retain the old leathern cases, of which we yet preserve some trace in our flasks. Archdeacon Nares, who published his "Glossary" in 1822, observes, in reference to various meanings of the word *jack*: "A kind of pitcher, made of leather, was similarly called a jack, even within my memory." This is, however, not quite explicit, as originally, at all events, the jack was one of the larger vessels of a series. We see that Mr. Chappell, in his "Popular Music of the Olden Times," assigns the composition of the famous ballad of the "Praise of the Leather Bottel," on account of its metrical structure, to a very early period. It was certainly written on the model of the more ancient school of ballad poetry, and is by no means deficient in literary merit. The author is not known, but he was presumably a layman, who parodied in the exordium and burden of his production the style of many of the familiar effusions of the wandering ministrel of these long bye-gone days.

A SHADY SCHEME.

A PRETENDED HOT-AIR CURE FOR CONSUMPTION.

Our attention has been called to a pamphlet entitled "Proofs that Consumption Can be Cured," which, it is alleged, has been extensively circulated. As this pamphlet is issued by a concern which has been sending out broadcast "Private Medical Circulars" of an objectionable character, and which is managed by an individual whose methods we have more than once had occasion to expose, we gave the circular a careful perusal. The principal object seems to be to sell an apparatus for the inhalation of hot air, pretendedly patented by a "Dr.," and recommended to consumptives, who notoriously will grasp at a straw, to positively cure consumption. We addressed a letter of inquiry to the house physician of our largest hospital where consumption is almost wholly exclusively treated, and received the following reply, which will, no doubt, be of interest to many of our readers:

HOUSE OF REST FOR CONSUMPTIVES,
TREMONT, N. Y., *March* 22, 1890.

Editors AMERICAN ANALYST: I am not aware that any apparatus for the administration of superheated air by inhalation is recognized by the profession as possessing any appreciable virtue in the treatment of phthisis. My own experience in this hospital with these machines has resulted in discarding them. An unprejudiced trial was given in about 100 cases. I do not refer to medicated vapors. In the hands of laymen the hot air treatment is dangerous. I can furnish you a large number of clinical facts regarding the limited possibilities of all inhalations, excepting those composed of medicated gases, if it be worth while.

Very truly yours,
W. E. S. PRESTON, M. D.

DOUBLE SCREWS.—Admiral Albini of the Italian navy says that the man-of-war of the future will have double screws and a helm at each end, so that it can turn around without losing any time. Its sides, he says, will be unarmored.

OBEDIENCE TO HIGHER LAW.—Mrs. Talloan Hyde observes with horror that her new coachman, just floated over, has on a pair of blue overalls. "Fotheringham," she says, "those overalls don't look very stylish; you'd better take them off."

"Yes, me lady," says Hodge Fotheringham, "but Ah've nowt else annerneath 'em, me lady." They drove on.—*Burdette.*

INFERENTIAL.—A naughty boy one day eluded punishment by creeping under the bed, where his mother could not reach him. Shortly after, his father came, and when told of the state of affairs, crawled on his hands and knees in search of his son and heir, when, to his astonishment, he was greeted with the inquiry: "Is she after you too, father?"—*Sanitary Era.*

A LONG-LIVED ARC LAMP.—A rotary arc lamp is soon to be put on the market by a Boston firm. In place of the ordinary pencil carbons, carbon disks are to be used, and as these are consumed they revolve, presenting new surfaces to the arc. It is said these lamps will last forty or fifty hours.

VALUABLE WINE.—In the wine cellar under the Hotel de Ville, Bremen, there are twelve cases of holy wine, each case inscribed with the name of one of the apostles. It was deposited in its present resting place 265 years ago. One case of this wine, consisting of five oxhofts of 204 bottles, cost 500 rix dollars in 1624. Including the expense of keeping up the cellar, interest on the original outlay and upon interest, one of those oxhofts would to-day cost 555,657,640 rix dollars, or $2,000,000 a bottle.

DOMESTIC ANALYSIS.—A negro went to Mr. E——'s office for the purpose of instituting a divorce suit against his wife. Mr. E—— proceeded to question him as to his grounds for complaint. Noticing that the man's voice failed him, Mr. E—— looked up from his papers and saw that big tears were running down over the cheeks of the applicant for divorce.

"Why," said the lawyer you seem to care a great for your wife. Did you love her?"

"Love her, sir? I jest analysed her!"

This was more than professional dignity could withstand, and Mr. E—— laughed until the negro, offended, carried his case elsewhere.—*New York Mercury.*

A NEW LUBRICANT.—A new mineral oil, termed dynamine, having the consistency of butter, has recently been introduced to the manufacturing public by La Compagnie Francaise des Graisses Minerals Consistantes. The new substance is not acid and is free from resinous matter and drying oils. It is very stable in character and does not undergo any change when exposed to the air. Its buttery consistency does not appear to be due to the addition of paraffine, vaseline or wax to a liquid oil, as it has a definite melting-point at 84 degs. C., and does not inflame at a temperature lower than 220 degs. In color it resembles butter, and it has no appreciable odor. These properties give it an especial value as a lubricator, and, as it has no chemical action on metals, dynamine is likely to be extensively used for the purpose.

GASTRONOMIC HINTS.

WHAT OUR ENGLISH COUSINS EAT BESIDES ROAST BEEF AND YORKSHIRE PUDDING.

A la mode beef is rendered additionally good by the inclusion of mushrooms, oysters and a cow heel. The gravy must be rich and thick.

The plan of cooking potatoes *a la Anna*, can scarcely be surpassed. It is an oven dish, dependent in a great degree on the quality of the butter used, without stint, in its preparation.

Thin slices of new bread, spread with the best golden syrup, and "topped" with a thick layer of Devonshire clotted cream, are delicious eating. They may be called "Thunder and Lightning Sandwiches."

Smoked cod roe is not to be despised as a breakfast relish. Soak the roe, then cut it into slices, and fry lightly in good butter; serve on rounds of hot fried bread, sprinkled with pepper, and a squeeze of lemon juice.

Eggs and gherkins make a tasty interior for a sandwich. Pound the yolk of the eggs finely, season with salt, cayenne, and mix with a little butter; the whites of the eggs and the gherkins must be minced very fine, and when all is mixed together the paste may be used for sandwiches.

Shrimp sandwiches made as follows will be found decidedly appetizing: Pound one pint shelled shrimps with half a small teaspoon of cayenne, one teaspoonful of anchovy sauce, half a teaspoon of lemon juice and salt to taste. Cut some thin white or brown bread and butter, spread the mixture on it, cover it with a second slice, press them together, and cut into delicate sandwiches, which serve nicely garnished on a white damask napkin.

Mushroom egg is a tasty dish, recommended in Hay's "Text Book of British Fungi." Take large, juicy mushrooms, cleanse, pare and remove the stems. Then mince and beat very gently with a spoonful of milk, pepper and salt, parsley and onion, until the juice has run out of the mushrooms. Then strain off all the liquor, and to every pint of it add the yolks of five eggs and the whites of three. Beat well together and heat quickly, stirring. Pour over toast and serve.

A culinary preparation which Arab *bons vivants* hold in high esteem is a curious sort of fish stew. The fish is chopped into small pieces, and gently stewed in the butter; balls of minced liver and vegetables are thrown in, and the whole taken to table with a sauce made of vinegar, capers, mustard, rue, cumin and celery. Rich gourmets vie with each other in attempting to render this dish of surpassing excellence; tongues, liver, and roes of rare and expensive kinds of fish being added to enhance the flavor and cost of the dainty.—*The Caterer.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

April.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, cod, snipe, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, perch, rock-fish, salmon, smelt, whitefish, trout, sturgeon.

VEGETABLES.—Artichokes, beans, carrots, celery garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

TOMATO SOUP.—Cut up your tomatoes and put them in a saucepan with some onions, a carrot or two, turnips, parsley and a few cloves. Boil until the carrots are well cooked; pass the soup through a sieve, put it back in the saucepan and boil for half an hour; season to taste, serve with dice of fried or toasted bread.

BEEF SAUSAGES.—To every three pounds of lean beef put a pound and a half of suet, chop fine and season with powdered sage, allspice, pepper and salt. Make into cakes and fry; have ready some skins thoroughly cleaned and force the meat into them.

CHICKEN SHORTCAKE.—Cut a chicken in pieces and stew till tender; make a thickening of cream and flour, adding a piece of butter, some pepper and salt. Bake two pieces of pie-crust, lay one on a dish, pour the chicken on it, put the other on top; serve.

WELSH RAREBIT.—If your cheese is hard grate it, if soft cut it into strips. Put the cheese and a lump of butter into a pan and set it over the fire; stir until melted, and thoroughly mixed with the butter; then add gradually a well-whipped yolk of an egg and half a glass of madeira; keep stirring until it forms a smooth mass, season with cayenne and grated nutmeg. Pour it over thin hot toast and serve immediately.

BARBECUED HAM.—Slice some raw ham and cook it in scalding water for half an hour; then lay the slice flat in a frying pan and pepper and salt them and spread on each quarter teaspoon of made mustard. Pour in vinegar, allowing half a teaspoon to a slice; fry quickly, turning often. When done take out and serve on a dish, add to the gravy half a glass of wine and a teaspoonful of sugar; boil up once and pour over the meat.

MRS. P.'S POUND CAKE.—One pound sugar, one pound best butter, one pound flour, twelve eggs, small teaspoonful of Horsford's baking powder sifted into the flour, a wineglassful of brandy, juice and rind of a lemon. Work the butter with your hand until it is soft, then with your hand also work it well into the flour; add sugar to the yolks of the eggs and beat until very light; add to the creamed flour and butter gradually the well-whipped white; add brandy and lomon and bake on two well buttered tins for about forty minutes.

LADIES' LUNCHEONS.

ECCENTRIC HABITS OF THE FAIR SEX WHEN WRESTLING WITH THE NOONTIDE MEAL.

The *Listener* has often thought of writing about the queer things that women eat in restaurants, but has shrunk from the subject because it seemed so large and appalling. He could never more than sketch it, anyway. It is certainly an inexplicable thing that women, when they go to restaurants to lunch, should eat so many preposterous things that they or their sisters seldom think of putting upon their tables at home. The *Listener* has repeatedly seen ladies make a lunch, with evident satisfaction, of plum-pudding and strawberry ice cream; and the ordinary midday meal of the suburban shopper or the down-town typewriter seems to be a quarter-section of cream pie with a glass of ice water! A great many ladies order a plate of griddle cakes, which they make their *piece de resistance*, deluging it with syrup, and following it with a French éclaire for dessert—and at least one whole glass of ice water, of course to slake the thirst caused by so many sweets. Has any physiologist explained this inordinate fondness of women for sweet things? And how do women who make regular lunches of such dishes as these ever survive them? It would really seem that the object of most ladies who go into restaurants alone is not to supply their systems with needed nourishment, but simply to kill hunger. Cream pie and éclaires will beguile hunger beautifully, besides tickling the palate. Therefore let cream pies and éclaires be eaten, whether they nourish the body or not. When ladies go to restaurants alone, the *Listener* has said, and he thinks said advisedly; for when they go with men they seem to come under the masculine influence in the matter of diet, and to eat chops or steaks or game very much as men do. And if they don't like those things, under such circumstances, they have remarkable success in acting as if they did. The *Listener* hastens to explain that he does not think that the ordinary masculine manner of lunching is by any means what it should be. Men, at lunch, commonly eat too much meat. They have had meat at breakfast; they are to have meat at dinner, at six o'clock; and they go to the restaurant at one or two and order chops or ragouts or what not, very much as if there were nothing else in the world to eat but meat. In their way, they abuse their stomachs as grievously as women do. Whether or not the Lord intended man should be a carnivorous animal, he certainly never intended that inactive men should fill their stomachs with the flesh of beasts three times a day and every day. No wonder that men often become soggy, heavy and apoplectic on their exclusive diet of meat, while women, with their terrible tendency to live on sugar and pie-crust, become emaciated, half-starved and highly nervous. There are some people who are sensible enough to adopt the happy mean because they see the wisdom of it; and there are a great many others who can only be brought to it by hard, disagreeable experience and the doctor's direful warnings. There was one lady at a restaurant where the *Listener* lunched, the other day, who did not eat sweets—except, possibly, in their natural condition. This was the order which she addressed to the waiter: "French fried potatoes, Vienna bread and butter, two bananas and a small cup of coffee." The waiter made her repeat the order. "Noffin' wid de pertaters, ma'am?" he asked. "Nothing but what I have told you." He brought the French fried potatoes, as if reluctantly, and the lady had to send him back after the right kind of bread; and it was a good while before he straggled around from another part of the restaurant with the bananas and the coffee. The lady took it all very philosophically, as if she were used to it. (By the way, the *Listener* is told by a lady that French fried potatoes and bread and butter are a very appetizing combination.) The lady who gave this order looked as if she had a strong mind without being "strong-minded," and certainly she had not a dyspeptic look. It is, too, a fact, the women not infreqnently order a plate of soup for lunch, or a clam chowder; some restaurants, indeed make a sort of specialty of clam chowders for ladies' lunches. To dismiss this subject, here is an order given by a lady, overheard at a popular restaurant not longer ago than last evening:

"Waiter, please bring me a broiled *live* lobster—and, waiter! be sure and have it *fresh!*"—*Boston Transcript.*

WOMEN'S WORK.

A YOUNG WOMAN WHO HAD ATTENDED A TRAINING SCHOOL.

An English woman from the middle class came to America to be her younger brother's housekeeper, and at the end of a year he died. She had no near relatives and knew she must support herself here. In her distress, she went to her rector, whose first inquiry was "What can you do well?" Gradually he drew from her the fact that she had learned carpentry in a parish school for training women. A bright thought struck him as he recalled his wife's impatient waiting for a carpenter "to do up the odd jobs round the house." The woman gladly accepted his suggestion of testing her ability at repairs the next day. With her "kit" of tools, she neatly and deftly accomplished the work of restoring a broken screen, a disgruntled bedstead, a warped door, two rickety chairs, a tricksy window shade,

some obstinate bureau drawers, a shaky table, and a discouraged cabinet that had fallen in pieces. She brought a small pot of shellac, with which she "touched up" the furniture, hiding all the traces of repairs. She also built a playhouse in the little daughter's room out of some boxes she found in the cellar, making the pine wood quite presentable with a coat of shellac. In moving a large easy chair she found the castors stiff and squeaky, so she went through the house and oiled every castor, so that they responded to a light touch with a freedom of motion as delightful as it is rare. The rector's wife was greatly pleased and said "She's worth a dozen men, she is so handy, and she never leaves a bit of dirt." The rector recommended her to other families, and she soon found herself in good demand. She was frequently asked to supply missing keys and repair broken locks. With rare good sense, she put herself in training under a locksmith, and was soon able to meet this emergency. She gets $2.50 a day and her lunch and dinner. Probably the work she does, if sent out of the house to be done would cost the family twice that amount. Many a gibe is hurled at women for their infelicitous use of the hammer, but this woman earns with hers a better living than any shop girl or seamstress.—*Ladies' Home Journal.*

BUSINESS NOTES.

TABASCO.

This is the name of a well-known pepper sauce or liquid pepper which has become a household necessity in every well-regulated family. It is only made by Mr. E. McIlhenny, of New Iberia, La., who obtained his seed from Central America, and by careful cultivation, in the congenial climate of Louisiana has succeeded in making this preparation one of the finest condiments in the world. It is not only useful in the kitchen, but as a digestive on the table, it excites the appetite and as a difusible stimulant in the family medicine chest, it is far more reliable and efficacious than hot drops or Jamacia ginger. All grocers keep it.

GILT EDGE.

This is the name of a very neatly gotten up little book containing the name, business and resident addresses of the principal residents of St. Louis, Mo. It also gives the names of the millionaires, leading lawyers, educators, physicians, divines, society clubs, society ladies, and foreign consuls residing in that city. Besides these a list is given of the seventy people in the United States who are credited with wealth of over five million dollars each. The value of such a work for business men desiring such information is obvious. It is published by the Push Your Business Co., of St. Louis, and costs only two dollars.

AN EXPRESSION OF CONFIDENCE.

Geo. P. Rowell & Co., of New York, the publishers of the American Newspaper Directory, undertake to rate newspaper circulations very much as the mercantile agencies report the capital and credit of the business community. About one publisher in ten tells his exact issue with truthful precision. Some of the other nine decline to tell the facts because they assert that those who do tell are in the habit of lying. Rowell & Co., after an experience of more than twenty years, have come to the conclusion that this view cannot be sustained. In the twenty-second annual issue of their book, now in the binder's hands, they designate every paper that is rated in accordance with a detailed statement from the publisher; and offer to pay a hundred dollars for every instance which can be pointed out of a misstatement for which a publisher is responsible. The AMERICAN ANALYST is one of the papers that is willing to have it known how many it prints and whose good faith the Directory publishers will guarantee.

HANDSOME COMPLIMENT.

A London exchange describes in detail a banquet that was recently given at the Hotel Metropole, by the press of Great Britain, the Colonies, and America, to Mr T. J. Barratt, the managing partner of the well-known firm of Messrs. A. & F. Pears, in recognition of the immense services he has rendered to printing, artistic and kindred enterprises, by the leading part he has taken in the development of advertising in all its branches. The chair was occupied by Sir Algernon Borthwick, and over 200 guests were present, including a very distinguished company. The presentation of a handsome service of plate, valued at £1,000, was made to Mr. Barratt, together with an illuminated address containing the names of over a thousand subscribing newspapers. The great surprise of the evening was the gift of a thousand guineas to the Newspaper Press Fund, by Messrs. Pears, the announcement of which was received with the most enthusiastic applause, the contribution being nearly double that of any previous subscription to the same fund. In returning thanks Mr. Barratt gave some interesting statistics stating that his firm now expended over £100,000 a year in advertising, which he thought was a fair contribution for one firm to make towards the extension of the press. He further stated that his large experience had taught him that advertising lessened the cost of the article produced, the greater sale that was thus brought about enabling them to sell their goods more cheaply than otherwise would have been possible.

WHY IT STOPPED.—About half of the electric clocks in Danbury, Conn., stopped a morning or two since. Investigation showed that the circuit had been destroyed by a man who cut off a piece of the wire to tie up his stovepipe. There are times in every man's life when such a little thing as stopping a clock or two is of small moment, particularly if he is wrestling with an unruly stove pipe.

DISPELLING AN ILLUSION.—One often reads pathetic stories of pet birds that die simultaneously with, or shortly after, their child owners. It sounds pretty, but the simple prose of the matter often is that the owners infected the birds. Canaries and other songsters will catch scarlet fever, measles, diphtheria, or almost any other human disease, and if left in the sick room they are almost sure to be infected. Pet cats and small dogs, too, are often sacrificed in the same way, and in their cases there is also the risk that they will go out and become the unwitting instruments of disseminating disease.

Big Plate.—The largest sheet of plate-glass ever cast in the United States is claimed by the Diamond Plate Glass Works, of Kokomo, Ind. Its dimensions are 122 by 202 inches, or 170 square feet, and its weight in the rough was 1,530 pounds. When finished it weighed 582½ pounds. The next largest plate ever cast was at Crystal City three years ago. That plate was 130 by 186 inches, but, while 8 inches wider than the one cast at Kokomo, it was 16 inches shorter.

Clever Birds.—An engine-driver on one of the Scotch lines reports that he has noticed that certain hawks of the merlin or "stone falcon" species make use of the passing of the trains for predatory purposes. They fly close behind the train, near the ground, partly hidden by the smoke, but carefully watching for the small birds which, frightened by the train as it rushes roaring past, fly up in bewildered shoals; the merlins then, while the little birds are thinking more of the train than of lurking foes, swoop on them from the ambush of the smoke, and strike them down with ease. If they miss, they return to the wake of the carriages and resume their flight and their hunt. They can, it seems, easily keep pace with an express train, and outstrip it when they please.

Deafness and the Telephone.—At a recent meeting of the Academy of Medicine, Cincinnati, Dr. Francis Dowling read an interesting paper on "The Causes and treatment of Deafness." He stated that between the ages of 10 and 40, at least one person in three is subject to a partial deafness. The great majority of cases of impaired hearing date from childhood and its diseases. Another prolific cause was colds and carelessness in bathing. At least one-fifth of the cases of impaired hearing are hereditary, and are largely owing to a too close consanguinity of the parents. Deafness is more prevalent among males than among females, owing to the fact that the male is more exposed to the vicissitudes of climate. There is much more deafness in America than in Europe, and this the doctor attributes to a more general use of scientific instruments, such as telephones, when one ear is used to the exclusion of the other. He cited a number of cases where he had examined telephone operators, and he generally found the right ear the weaker organ, as it was used almost entirely in telephonic communication. A remedy was to use both ears. Either have two audiphones or alternate the ears.

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CONTENTS.

ADULTERATION RAMPANT.

Our esteemed contemporary the *New England Grocer* takes a pessimistic view of the subject of adulteration, which nefarious branch of industry it believes is being developed into a science. A New York firm, it declares, and we wish it had gone further into particulars and given us the names, makes its fruit essences out of compound ethers distilled from rancid cheese, bad butter, plain alcohol and similar ingredients. These essences are sold to soda water dispensers. Dealers in teas, the *Grocer* adds, use the leaves of the sycamore, horse chestnut and plum trees as adulterations to increase the bulk, and the sulphate of iron for flavoring, while chicory, so long used as an adulterant of coffee, is according to reliable authority, itself very largely adulterated with beet root, dried and burned or roasted—in fact, prepared in the same manner as chicory. The mixture for it is usually composed of one-third pure chicory and two-thirds roasted beet roots. Such adulterants as these, of course, come under the head as frauds, but cannot be considered injurious. That it is not by any means the rule with all agents used for like purposes. Take vanilla extract, for instance. There is good reason for believing that some of the cheap preparations under the name do not contain, even, a trace of the vanilla bean, but are made from the poisonous tonka bean, called "snuff bean," which has an odor and taste somewhat similar to vanilla. The best vanilla beans cost between $15 and $20 a pound, while tonka beans can be bought for about $1 a pound. Of course, some one has been sure to take advantage of these facts and make spurious vanilla extracts, notwithstanding that they are capable of doing infinite harm. In the scramble after the mighty dollar one's conscience soon becomes blunted and rarely occasions much uneasiness. What little remonstrance it makes is in the case of many manufacturers of foods, readily satisfied by the argument that the public, as a rule, insist upon having cheap goods, and there is no room in the business for the man who cannot supply them. When it becomes universally known that economy in foods and medicines is "pound foolishness," then, and not until then, will the practice of adulteration decline.

IMPORTED WATERS.

The McKinley tariff bill puts on the free list, among other things, the following articles: "Natural mineral waters and all mineral waters not effervescent or artificial, and natural mineral salts, accompanied by the sworn certificates from the proper officers operating the springs showing them to be obtained by evaporation, and shall not contain any admixture of any substance foreign to the natural water of such springs." Under almost similar provisions to those above described, a host of so-called mineral waters are now regularly imported here, duty free, on the pretence that they are natural waters. It is a notorious fact, as was proven before the United States Courts some years ago, that the Apollinaris water that used to be so largely imported into this country has an addition of carbonic acid and common salt made to it. Undoubtedly there are other such manufactured or manipulated waters brought here. Why should they not pay duty, and thus our home manufacturers of artificial mineral waters be protected? And while we are on this subject, would it not be well to carefully examine the so-called imported Carlsbad Salts?

ARTISANS AND ART.

The French people—those, at least, of Paris, and Paris is France—have practical faith in the efficacy of art as a handmaid to labor. There are in the French capital two classes of art schools: Those intended for the technical education of painters, sculptors and architects, and those devoted to training artisans employed in decorative art, iron and bronze workers, masons, potters, cabinet makers, house painters, paper stainers, weavers and others. These latter institutions, where the artisan obtains instruction, are supported, some by Government and the rest by the municipality of Paris, but all are free. Paris expends upwards of $200,000 annually for instruction in drawing and modeling alone, and has five evening schools for artisans, with 450 students on the roll. Besides this, the municipality has drawing taught in all the primary schools. In addition, the City Council has endowed a preparatory school of practical drawing and a school for the application of art to industrial purposes. Thus is inculcated an appreciation of the general principles underlying all the arts, a thorough control of tools, and a knowledge of materials and their special adaptability to various purposes. Last but not least, there is encouragement to original design and composition, by which is avoided the dull and monotonous sameness so often seen in schools of art. Monthly competitions are held, so that as soon as a pupil is proficient in one branch of instruction no vexatious delay ensues before his advancement to the next division. They also keep up a constant and living interest in the progress of education, and, as a certain fixed period is given for each course, the student's attention and energy are still further concentrated. The Parisian municipality devote a large annual expenditure to the decoration of their public buildings by historical and national pictures. Such methods of art instruction appear admirably calculated to form and develop an intelligent class of artisans.

TAKING THE CENSUS.

On the second of June the census enumerators will begin to collate their facts and figures. The United States have been mapped out for this purpose into 175 Supervisors' districts, in each of which there will be at least two hundred enumerators. A month will be given to field work, but it is calculated the figures of the enumerators will be ready to forward to the superintendent at Washington by July 1. These figures will probably be little more than the gross results, as the details will require more time to be worked out. From these gross totals the Washington experts will find out a rough total of the population of the United States, which they expect to have ready for publication early in August. In the work of enumerating the population, the supervisor's district is the unit; the supervisor appoints the enumerators who are given two weeks in cities of more than ten thousand inhabitants, and a month in rural districts, in which to finish their work. Each enumerator is to be supplied with the following schedule of questions:

1. Give Christain name in full, and initial of middle name, surname.
2. Whether a soldier, sailor or marine during the Civil War (United States or Confederate) or widow of such person.
3. Relationship to head of family.
4. Whether white or black, mulatto, quadroon, octoroon, Chinese, Japanese, or Indian.
5. Sex.
6. Age at nearest birthday. If under one year give age in months.
7. Whether single, married, widowed or divorced.

8. Whether married during the census year (June 1, 1889, to May 31, 1890.)

9. Mother of how many children, the number of these children living.

10. Place of birth.

11. Place of birth of father.

12. Place of birth of mother.

13. Number of years in the United States.

14. Whether naturalized.

15. Whether naturalization papers have been taken out.

16. Profession, trade or occupation.

17. Months unemployed during the census year (June 1, 1889, to May 31, 1890.)

18. Attendance at school (in months) during the census year (June 1, 1889, to May 31, 1890.)

19. Able to read.

20. Able to write.

21. Able to speak English. If not the language or dialect spoken.

22. Whether suffering from acute or chronic disease, with name of disease and the length of time afflicted.

23. Whether defective in mind, sight, hearing or speech, or whether crippled, maimed or deformed, name of defect.

24. Whether a prisoner, convict, homeless child, pauper.

25 and 26. Is the home you live in hired, or is it owned by the head or by a member of the family?

27. If owned by head or member of family, is the house free from mortgage incumbrance?

28. If the head of the family is a farmer, is the farm which he cultivates hired, or is it owned by him or a member of his family?

29. If owned by head or member of family, is the farm free from mortgage incumbrance?

30. If the home or farm is owned by head or member of family, and mortgaged, give the post office address of owner.

BRANDING BEER.

In the United States Senate on April 1st, a reform measure was set on foot which, if realized, will in the eyes of a very large constituency place its introducer on the footing of a public benefactor. Senator Stewart, of Nevada, introduced a bill which, while it ostensibly provides for regulating and taxing the sale of adulterated beer has really for its object the suppression of the whole business of making and retailing the deleterious substitutes for pure malt liquors now sold so largely. Mr. Stewart proposes to have adulterated beer sold for just what it professes to be, and has drawn a number of stringent provisions to regulate the traffic in impure brewings. Any brand of beer in the making of which hops are replaced by glucose, carbonate of soda and various other substitutes is declared to be adulterated, and the Commissioner of Internal Revenue is called upon to institute proper tests by which the fact of adulteration may be shown. Every brewer of "adulterated beer" will be required to pay an annual license fee of $1,000; every wholesale dealer one of $500, and every retailer one of $50. Each cask of impure beer sold from a brewery must be labelled conspicously "adulterated beer," and each bottle sent out must have the same words blown in the glass. Heavy penalties both fines and imprisonment, are provided for offences against this regulation and the enforcement of the law in all its details is confided to the Internal Revenue Department of the Government. The Nevada Senator hopes to make fraudulent beers odious and thus force the brewers into manufacturing pure brands. He has a big job on hand and will encounter many obstacles before his end is attained.

ALUMINUM.

ITS OCCURRENCE, MANUFACTURE, USE AND FUTURE PROSPECTS.

Learned men have indulged in wild talk about this metal, which is more widely distributed over the globe than any other, being known to exist in 200 different minerals, including all granites and common clays. Wm. Anderson, C.E., in a recent address before a scientific society in England, stated that aluminum was discovered as a distinct metal by Marggraff 136 years ago; whereas the latter only showed that alumina was a distinct earth, the discovery of its metallic base being reserved for Woehler, who separated it as such in 1828. If scientific men thus err, what may be looked for from the ordinary public? A recent order from a prominent manufacturer calls for a quantity of "illuminum." At a late club meeting in a large New England city a capitalist inquired as to the precise object of the "alumni factory" just built at Bridgeport; whereupon a Yale graduate gravely assured him that the best factory of that sort was located at New Haven. The money king innocently, but aptly, replied that "if the Bridgeport article was no better than that produced at New Haven, he thought it would hardly find a market." He had been misled by the common mispronunciation of "alumnium." The problem has been to extract the metal cheaply, and chemists of every land have labored for a solution. Oerstedt suggested a process of obtaining aluminum by treating the chloride with an alkali metal. Adopted by Woehler, and modified by Deville, the process was "a reduction of the double chloride of aluminum and sodium, by means of metallic sodium, in the presence of cryolite." It was thus that Deville was able to show at the Paris exhibition in 1855, as the greatest of modern chemical wonders, a bar of what he styled "silver-white metal made from clay." He sold aluminum first at $15 an ounce, but in 1857 he reduced the price to $2 an ounce. Improvements cheapened the product still further, so that Colonel Frishmuth, who cast the tip of the Washington monument, in 1884, was able to furnish the metal in bars at $15 a pound. In that year, however, he made only 1,800 ounces, and the entire import was but 590 pounds. Prior to 1887, the entire amount manufactured annually was but 10,000 pounds, and it sold that year at $10 a pound. To get even this small amount required the annual manufacture of 100,000 pounds of the double chloride and 40,000 pounds of sodium. To cheapen these two preliminary processes was essential to the cheap production of aluminum. Hence the importance of the process patented by Mr. Hamilton Y. Castner, June 1, 1886, which was the first patent ever granted for an aluminum process in the United States. Its special feature was a cheap way of getting sodium. He reduced and distilled it in large iron crucibles, raised automatically through apertures in the bottom of the furnace, where they remain till the reduction is completed and the sodium distilled. Through tubes in stationary covers the distilled metal passes to condensers, where it is solidified. When the process is completed, the crucible is lowered and a new one with a fresh charge is substituted and raised into the furnace. The residues are carbonate of soda and metallic iron, both of which can again be utilized. The process is as simple as it is ingenious, and the temperature required is very moderate. The sodium distilling as easily as zinc. One charge requires about an hour, and a battery of four furnaces can yield a ton of sodium a day. The metal is kept from oxidation by a covering of mineral oil till used. The Deville-Castner process takes the double chloride finely divided and mixed with thin slices of sodium, and empties the mixing cylinder on the hearth of a reverberatory furnace, where the mass quickly melts, and a reaction takes place that finally liberates a silvery stream of molton aluminum that is drawn out from below, while the melted slag runs off from above. The first run is purest and contains about three-fourths of the charge. The remainder is scraped off from the hearth, or found entangled with the slag, from which it has to be separated. The aluminum is finally remelted in plumbago crucibles, and cast into ingots, bars, or plates. The *Journal of the Society of Arts*, from whose very extended account the foregoing is abridged, adds that, day by day, as the manufacture progresses, improvements are made which either enhance the economy of production or the purity of the product, and speaks in the highest praise of the skill, energy, and perseverance of Mr. Castner and his assistants, by whom, more than any others, aluminum has been brought into the market on commercially practicable terms, and in a condition of almost perfect purity. Grabau's process may be briefly described. Powdered cryolite put into a solution of the sulphate of aluminum gives by reaction the fluoride of aluminum, which is then heated till ready to evaporate. The heated fluoride is pulverized and thrown upon melted sodium contained in a vessel lined with cryolite. The heat generated by the violent reaction melts the aluminum as well as the cryolite; and the molten mass being poured out, the pure aluminum setles at the bottom, while the cryolite is at the top. The main advantage of this method over the Castner process is that it goes on at a lower temperature and is extremely simple. Numerous other processes are described by Richards in his exhaustive work on the subject, *e. g.* reduction by cyanogen, by hydrogen, by carbureted hydrogen, by carbon and carbon-dioxide, concerning all of which Dr. T. Sterry Hunt remarks that "there has been no pure aluminum made commercially safe from the chloride by the use of sodium." Webster is the chief manufacturer in England, on his own patents; and large works have been erected in France on Bunsen and Deville's process by electrolysis. But, after all, the only true rival of the Castner-Deville process seems to be the Hall process, on patents of Charles M. Hall, and carried on by the Pittsburg Reduction Company, who are now selling pure aluminum at a rate cheaper than nickel; and tons of metal are rolled by the Scovill Manufacturing Company, of Waterbury, into sheets, bars, rods, and tubing at a price less than German silver. Briefly the Hall process is this: A flux being discovered that, at a moderate temperature, takes the aluminum ore into solution, and that is of lighter specific gravity, and that also is unaffected by the passage of an electric current, he fils a series of carbon-lined steel pots with the flux which is kept in a melted condition. Carbon electrodes are plunged into these baths, through which passes the electrical current, which acts to send the aluminum to the sides and bottom of each pot. The baths are constantly replenished with ore and the process thus goes on for an indefinite period night and day, at small cost, and dmanding but little attention. Aluminum, whether pure or in combination, deserves to rank with the noble metals—although in certain forms it makes the basis of our common clay, every cubic yard of which is said to contain 800 lbs. of the metal; in other forms it is massed in mountains; and in others still it shines among the most precious stones, entering

into the composition of the ruby, sapphire, topaz, garnet, lapis-lazuli, and tourmaline. Cryolite, found in Greenland, and beauxite, first found at Beaux in France, but since in Austria, Ireland and elsewhere, are the ores relied on for the manufacture of aluminum. Cryolite is a snow-white mineral, though often tinged red or yellow by impurities. Beauxite is a hard white clay occurring in beds many feet thick. Corundum, found in Georgia, is the material relied on in America especially for making the alloys. It varies from dull blue to black, and exists in massive form, as well as in crystals. The cost at the factory of these different minerals varies from $60 to $140 a ton. The properties of aluminum are now generally known. Its color is white delicately tinged with blue, and it resembles silver more than any other metal. It takes a brilliant polish, and may be rolled or forged as easy as gold or silver, and may be beaten into very thin leaves. It can be pressed or stamped into all sorts of shapes, or drawn into very fine wire. Its elasticity and tenacity are about the same as virgin silver, but change greatly under the hammer. It is said to resist the graving tool till properly varnished. when it may be cut like copper. Its sonorousness is very curious. Cast in bell form its sound is sharp, and not prolonged; but struck as a bar it is remarkably sweet, pure, and resonant. Its sound is resolved into two tones related to each other as are D and A. It might not work well in the form of tubular wind instruments; but fine effects might be had from a series of chromatic bars. I do not know that the experiment has been tried. In estimating the relative cost of aluminum as compared with other metals, we must take its specific gravity into the account. A bar of aluminum weighing one pound would be about four times as large as a similar bar of silver, brass, bronze, tin or iron. Hence, at an equal price, aluminum would be four times as cheap as silver. But as in now costs by weight only one-eighth as much, it would be relatively about 32 times as cheap. In other words, the purchaser would find it economical to use aluminum in preference to silver for everything to which it is adapted. As a conductor of electricity it equals silver, and is eight times better than iron, and as a conductor of heat it excels any other metal known. Neither air nor water, hot or cold, affects it, and it resists all acids except hydrochloric. It slowly yields to a mixture, of salt and vinegar, with a result as harmless as clay itself. It does not seem to be affected by saliva, perspiration, or other animal agents Hydrogen, nitrogen, sulphur and carbon do not affect it, but it is rapidly attacked by chlorine, fluorine, iodine and bromine. From the above observation aluminum does not seem to have an intimate analogy with any other known metal, though Richards and Woehler place it near to silicon and boron in the carbon series. Aluminum melts slowly, at about 700 degrees C., (1292 degrees Fah.) without a flux, and in an ordinary uncovered earthern crucible lined with carbon the pieces of divided metal are first dipped in benzine to clean them, and if necessary are treated with nitric acid, and then put in the crucible little by little. A cinder remains at the bottom of the crucible. The molten metal may be cast either in metalic moulds or in very dry porous sand with numerous vents. Deville prefers a plumbago crucible without a lid, and exposes the red hot metal for a long time to the open air, to allow the exhalation of the acid fumes after which the surface is skimmed without loss of metal. It is then cast into ingots. To get perfectly clean results this process is repeated three or four times. The pure metal thus obtained improves in color with using, while what is less pure tarnishes in time, though perhaps equally brilliant on first casting. The Aluminum Company, with offices at 115 Cannon Street, London, and works at Oldbury, near Birmingham, issued a price list, November 1, 1889, from which we quote aluminum, 99 and qr. to 99 and 3 qr. per cent. purity guaranteed, 15 shillings per pound; 98 to 99, ditto; 95 to 96, 12 shillings a pound. The first article manufactured from pure aluminum was a rattle for the young Prince Imperial of France, in 1856, the sonorousness of which was much admired. It was next made into jewelery, medals, and inlaid work. Its extreme lightness led to its being used for sextants, eye glasses, opera glasses and the tubes of telescopes. It has been found useful for the beams of balances, for delicate weights, and in the form of fine wire for embroidery. Culinary articles made from it were to be seen at the London exhibition in 1862, for which it seems admirably adapted on account of its lightness and immunity from corrosion. Experiments have been rapidly multiplied of late, under the encouragament given by reason of the increased cheapness of the metal, and a promising field is surely opening for its employment for many ornamental and useful purposes. The process of soldering, welding, veneering, gilding, and silvering aluminum are minutely described in Richard's work on the subject. The imagination has been allowed free play as to the manifold advantages of a metal at once so light and so strong. As a single specimen of the poetical flights of which scientific men are sometimes capable, I quote the prediction of one of the most eminent savants of America that "Some day aluminum will revolutionize the world. It will be used in the construction of houses, thus superseding wood, stone and brick. It will take the place of iron in ship building. The ocean steamer of to-day will be but a canal boat compared with the aluminum ship that will fly as a bird over the waves." To all of which we can only say—possibly! The aluminum industry is on a firm footing, both in Europe and America. There have sprung up two distinct lines of manufacture; the one a chemical process, and the other strictly metallurgical. The former produces pure aluminum, and continues to be a complicated process demanding skill and patience. The latter produces only the alloys of aluminum, and has been made extremely simple.—*H. C. Hovey in Scientific American.*

WOMEN'S WORK.

SOME OF THE NOTABLE THINGS WOMEN HAVE DONE.

As long ago as 1702, Elizabeth Mallet established the first daily newspaper published in London, almost two hundred years ago. It was reformatory—published, she said in her salutatory, "to spare the public half the impertinence which the ordinary papers contain." The Massachusetts *News-Letter* was the first paper published in America, of which we have any record. After the death of the editor, his widow edited it in a very spirited manner. It was the only paper that did not suspend publication when Boston was besieged by the British. The widow's name was Margaret Craper. The first paper published in Rhode Island was in 1772, and was owned and edited by Anna Franklin. She, with her two daughters, did the printing, and their servants worked the printing press. Mrs. Franklin was afterwards appointed printer to the colony, supplying pamphlets to the colonial officers. She also printed an edition of the colonial laws, of three hundred and forty pages. In 1776, Sarah Goddard printed a paper in Newport, R. I.; she ably conducted it, and afterwards associated with her John Carter. The firm was Sarah Goddard & Company. Clementine Reid published a paper in Virginia in 1772, advocating the colonial cause, greatly offending the royalists. Another paper was started two years afterward, in the interest of the Crown, by Mrs. H. Byle, borrowing the name of Mrs. Reid's paper, the Virrginia *Gazette*. The Crown paper was short-lived. Both papers were published in the town of Williamsburg. Mrs. Reid's paper was the first paper in which the Declaration of Independence was published. Elizabeth Timothy edited and published a paper in 1773, in Charleston, S. C. After the Revolution, Anne Timothy became the editor, and was appointed State printer, which position she held seventeen years. Mary Crouch, about the same time, published a paper in Charleston in special opposition to the Stamp Act. She afterward removed her paper to Salem, Mass., and continued its publication there for years. Augusta Evans Wilson, the distinguished southern author, during the war between the States, rented a house and established a private hospital, where, with her own hands, she nursed the sick of the neighboring camp Beulah, through weary days and hopeless nights, with unfailing tenderness and patience. Mrs. Gladstone, whose last mile-stone on the road of time marked 76, is a notable example of a true helpmate. Her distinguished husband owes much of his success to the solace and comfort of his wife's presence and counsel. Dickens said somewhere that he owed to his mother his great desire for learning. Despite the pinching poverty by which she was surrounded, she taught her children the great advantages of learning, and taught them the rudiments of English and Latin. Miss Dorothea Dix began her philanthropic work as far back as 1834. She was at the head of the women nurses during the war. Among the self-made women of our day may be mentioned Sarah Bernhardt, Lucy Larcom, Adelaide Neilson, Charlotte Cushman, Jenny Lind, Maria Mitchell, Minnie Hauk, and many others who have overcome, in many instances, seemingly insurmountable obstacles, and pushed their way to fame.—*Nightingale.*

HANDY HINTS.

SOME THINGS EVERY YOUNG HOUSEKEEPER SHOULD KNOW.

That buttermilk will take out mildew stains.

That bottles are easily cleaned with hot water and fine coals.

That a pallet knife should be used to scrape pots and kettles.

That old napkins and old table cloths make the very best of glass cloths.

That zinc is best cleaned with hot soapy water, then polished with kerosene.

That it is well to keep large pieces of charcoal in damp corners and in dark places.

That oilcloth can be kept bright for years if properly varnished each season with any good siccative.

That if the hands are rubbed on a stick of celery after peeling onions the smell will be entirely removed.

That if soap is purchased in large quantities, and kept in a warm, dry place, half the usual amount will be required.

That tubs will not warp or crack open, if the precaution is taken to put a pail of water into each, directly after use.

That if a cucumber is cut into strips and the pieces put into places where ants are found, it will surely drive them away.

USEFUL TO BATHERS.—It is said that sharks will not bite a swimmer who keeps his legs in motion. If you can keep kicking longer than a shark can keep waiting you are all right.

SUGAR AND FLOUR.—The unusual attention drawn to the subject of sugar by the differences of opinion as to what the scale of sugar duties shall be has brought out a very interesting fact, that the average money value of sugar used by one person in this country in a year is less than the averege money value of flour. Last year the per capita consumption of sugar was worth $4.53, and this year it will be about $4. The average consumption of flour is $5.50 to $6 per annum.

SHEARING BY ELECTRICITY.—A remarkable application of electricity is being made in Australia. The problem of shearing sheep economically and speedily has been solved by the use of the electric motor in conjunction with a new shearing machine, invented by Frederick York Wolseley, a brother of the eminent general bearing that name. The method of using the sheers is very simple, the operator having merely to throw a friction wheel into adjustment by means of a handle, and then push the comb into the wool, pressing it continuously forward and keeping it as closely as possible to the body of the animal being operated upon. From one to a hundred shears can be operated at one one time, according to the power used.—*Electrical Review.*

MILLIONS DAILY.

THE DAILY CONSUMPTION OF EGGS IN THIS CITY.

The backbone of the New York Mercantile Exchange is its egg trade. Just now there is much dissatisfaction with the mode by which the sale of eggs is conducted. Too long credit is said to be given, and the sale of ten barrels may establish prices for the day. The manner by which prices are established is also objected to. Eggs are classed as "new laid," "fresh gathered," "refrigerator," "held" and "limed," and graded as "firsts," "seconds" and "known marks." When the sale opens an authorized individual, known as the caller, asks: "Are there any bids or offerings of firsts?" and so on. It is complained that the call establishes what is regarded by the retailers as an "official" price, so that they wont pay any more, no matter how small a quantity they buy. A petition is in circulation, to which ninety-one signatures are already attached, asking the Executive Committee to take steps to suspend the call, with a view to its abolition, to provide that the sale of not less than fifty barrels shall establish a quotation, to limit credits, and also to remedy other evils which are complained of. It is not likely, the defenders of the call say, that the call can be abolished, or even suspended. Those who defend it say that the attack upon it is made with a view to close the Exchange. Their remedy is that the members of the Exchange bind themselves to charge all customers who are not members one quarter of a cent a dozen above the price established by the daily call. The business of the Exchange is better than it was last year. Between January 1 and March 13, 1889, there were 2,161 barrels and 9,300 cases of eggs sold at the Exchange. Between the same dates this year there were 1,681 barrels and 22,970 cases sold. A barrel contains 70 dozen eggs and a case 30 dozen. Lots of eggs are sold outside of the Mercantile Exchange. In Lent the New York sale probably amounts to 4,000 barrels, or 3,360,000 eggs a day.—*Sun.*

THE PRESIDENT'S RESIDENCE.

AN INSIDE VIEW OF THE WHITE HOUSE AND ITS ARRANGEMENTS.

An entertaining description of the Executive Mansion in Washington, from the ever-busy pen of Frank G. Carpenter, was published recently, from which we condense the following particulars, which, we believe, the readers of the AMERICAN ANALYST will find of interest:

The White House covers a third of an acre. It is a long, rectangular, almost squatty, two-story structure, with a wide porte cochere, having a floor as big as that of the average two-story house. This porte cochere is upheld by Ionic columns as big around as the largest oaks of the forest, and its roof, supported by these, is of the Grecian order. Around the roof of the White House there is a marble fence about as high as a table and made of round marble pillars the size of a base ball club. The building has a basement under it and two rows of big rectangular windows look out of the stories above this. The basement windows are square, and the most of them look as though they needed washing. The entire front of the basement of the White House is taken up with kitchens and laundry. The back has a store room, a furnace, and—whisper it low in the ear of our Methodist brother—a billiard room. Let us look at the first floor of the White House. Guards stand at the doors, and a giant Apollo, in the shape of Colonel Dinsmore inspects every man who comes in. The doors are of mahogany, and the knobs are as big, almost, as the head of a baby. You turn them and on brass hinges the great doors turn inward and you are in the tiled vestibule, at the back of which there is a wall of mosaic of beautiful stones and colored glass, which reminds one of the jeweled palace of Frederick the Great at Potsdam. Just next to this, at the left, is a hall with stairs leading to the President's office, and on the other side of this hall is the mighty east room. You never see Mrs. Harrison or any of the family upon these stairs. They are the property of the public, and the ceaseless tread of the countless crowd which besieges the President goes in muffled way up and down them. The east room belongs to the people. It is always open to visitors, and the only use that President Harrison gets from it is in crowding his callers into it at a big Presidential reception. It is one of the most beautiful rooms in the world. It walls are painted in silver and gold, and its ceiling is three times as high as that of an ordinary room. It takes 442 yards of brussels carpet to cover it, and the velvet into which your feet sink is of the color of Etruscan gold. The most wonderful thing to me in this room is the chandeliers. Each one of these is made of 6,000 pieces of Bohemian glass, and they cost $5,000 apiece. There are eight massive mirrors, each as big as two billiard tables, set into the walls about the room, and when the chandeliers are lighted these pendants are reflected like diamonds in the mirrors, and the scene is indescribably brilliant. Still, you might as well furnish a barn or a bowling alley and call it a parlor as to think of using this big room for the living room or the home life of a private family, and if President Harrison wanted it he couldn't get it, for the people have monopolized it by the precedent of generations. It is the same with the green room, the blue room and the red room. They are full of beauties in furniture and hangings, but they are as much shut out from the every-day life of the President as the parlor of a New England farmer's wife, which is dusted every day, but never used except for company. It is in the blue room that President Harrison, with his wife standing beside him, shakes the hands of the multitude at a big reception. The room is oval in shape, finished in blue satin fresco, and its diameter is about that of a country church. Still it is hardly large enough for this purpose, and when the crowd is out of it it is too big for common use. There are many dining rooms in Washington larger than the state dining room, and I can count on my fingers a dozen which are more beautifully furnished. There are none of the conveniences for serving a great dinner, and these thousand-dollar feasts which the President gives have to be largely gotten up outside of the house, and hired waiters have to be brought in to pass the victuals. The dining room used by the family, or the private dining room, is at the right of the vestibule. This has to be turned inside out at every big reception, for the table must be removed and shelves be put around the room to hold the hats and coats of the guests. At such receptions the state dining room becomes a ladies' dressing room. There is a general plan about the White House which, when once understood, makes the building simplicity itself. If you will take a rectangular covering one-third of an acre and bisect it lengthwise by a hall eighteen feet wide you will have a general plan of the building. On the ground floor at the end nearest the Treasury the great east room cuts off a part of this hall and runs the whole length of the building. The vestibule and the private dining room and the dressing room are on the north of this hall, and on the south are the green, blue, red and state dining rooms. All of the rooms of the building thus go of from this hall, and all are of the same length, viz.: about twenty-eight feet. At the extreme end of the lower floor is a great shed of glass covering the area of several ordinary houses, and making up the conservatories of the White House. This is no part, however, of the original structure, and it need hardly be considered with it. The second floor is on the same plan. All of the rooms are big, and three-fourths of them are made up of offices. The living rooms of the President are at the west end of the second floor, and Mrs. Harrison has only four good sized bedrooms. It takes about one hundred yards of carpet to cover each one of them, and she has turned the lower end of the hall into a sitting room, and the children are using the little private office at the northwest corner of the building where President Arthur used to receive his most intimate friends. In addition to these four bedrooms, two of which are on the north and two on the south side of the building, there is a little bedroom which was originally intended for a dressing room on the southwest corner, and a servant is lodged in a hall bedroom just over the vestibule, which is seven feet wide and eighteen feet long. There is an elevator leading to this floor, and there are two or three bathrooms huddled together right over the big entrance hall. The larger bedrooms have no bathrooms connected with them, and this is the case with the President's bedroom, which opens into the office, or library, where he receives his callers. The business offices of the White House take up the whole of the eastern portion of the second floor. Entering the big front door, you turn to the left and march up a pair of stairs about five feet wide. You note that, though the carpet is new, the tread of the office-seeker has worn off its nap, and at any hour of the morning you pass the most noted men of the country on the stairs. They stamp along as though they owned the building, and most of them think they do. When you reach the second floor you find that your surroundings are those of a business establishment rather than those of a private residence. Two colored gentlemen stand at guard at the door, and a gray-haired German, short and squatty, sits before a little desk as you enter the hall. He is in the corner made by the partition which has been run across the hall to give the President's wife a sitting room, and as he looks at you his back is turned toward the door of the room in which the Cabinet meets. This man is Sergeant Loeffler. He is the President's messenger, and he has been here for almost a score of years. He is, in a measure, the watch dog of the President, and he carries all the cards of noted visitors into Mr. Harrison. He has sometimes to deal with cranks in case these pass by the giant form and blue eyes of Colonel Dinsmore below. Sergeant Loeffler makes about the sixth guard you have passed since entering the White House. You are motioned by him to the left, and turning your eyes you see a couple more of colored guards, one of whom is the watch dog of the private secretary. You go by these into a big reception room, which is over the end of the east room, and which is filled with very ordinary furniture. It is here that office-seekers cool their heels until the President is ready to receive them, and it is here that Colonel Crook, the cashier of the President, sits. In a little room beyond this there is a telegraph office, and here the President has telephone connections with all of the great departments. Next to this there is another office, in which clerks work, and the lower end of the big hall has been partitioned off and made into an office. In the southeast corner of the building the executive clerk, Mr. Pruden, makes up with his fine Italian hand the commissions that the President gives to officers, and next to this office and opening into the hall is the private secretary's room. This is one of the big rooms of the building. It takes 109 yards of carpet to cover it, and it has windows which command a beautiful view of the Potomac. A cheery wood fire burns on one side of it, and in front of the windows and behind a big, flat desk sits the little five foot eight anatomy who represents to most of the callers the President of the United States. The Cabinet room lies between the private secretary's room and the library in which President Harrison sits. This room is almost entirely filled with a long dining table, which runs from one end of it to the other. Around this table are nine high-backed chairs, and there are writing materials placed at different stations upon it. There is a big globe in one corner of the room, and it is around this that the President, Secretary Blaine and the other ministers stand while they discuss international questions. The Cabinet meet here about every other day, and they usually spend several hours at a session. The President's office is in the library. This room is a big oval, requiring 141 yards of velvet Brussels to cover its floor. It has windows looking out upon the Potomac and it is fifty-nine feet wide and twenty-eight feet long. The President's callers are seated on chairs about the room and he usually stands with head bent over as he

talks with them. He receives nearly every one who has business with him, and he is besieged by a host of Congressmen nearly every day. It is this room which forms his home and his business is always with him. His bedroom is next to it, and the ghost of work undone must hover over him as he sleeps. The attic of the White House might be supposed to furnish some room. It does not. The roof is so low in most places that you cannot stand upright under it. All the light comes from the skylights and the place is fit for nothing but a lumber room. In it are stored President Harrison's trunks, Baby McKee's cast-off clothes and the old furniture of the executive mansion. Rats and spiders are about the only inhabitants, and the top of the White House is more like a country garret than the attic of a two-story house covering a quarter of an acre, and situated in one of the great cities of the United States. The truth about the matter is that the executive mansion would do very well for the private residence of the President or for his offices. It will not do for both, and the statesmen appreciate it. In 1882, Senator Morrill had a bill, which passed the Senate, appropriating $300,000 to build an extension to the White House, and Mrs. Harrison has said that there ought to be two wings added to it. She would remodel the conservatory, add a hall of painting and statuary and would leave the present building as it is, sandwiched between the ends of these two wings. In this way the historical associations of the building would be preserved, and Mrs. Harrison's ideas are much better than those of Senator Ingalls, who was in favor of adding a story to the building. The White House has cost already about $2,000,000. It took $300,000 to build it nearly one hundred years ago, and more than $1,700,000 have since been spent upon it. It is full of beauties in the way of furniture and pictures, and though it costs us more than $125,000 a year to pay the President's salary and keep up his establishment, we are rich and can afford it.

WEIGHT OF WATER.

THE NECESSITY FOR A NEW DETERMINATION OF THE FACT.

"The True Weight of Water" is the subject of an article in the *Engineer*, based on a report from the Standards Office of the Board of Trade recently issued, from which it appears that experiments have been in progress in the department since the year 1878 with a view to ascertain "what is the true weight of a cubic inch of distilled water." It is shown that the law passed in 1824 regulating the weights and measures was in reality based on weighings made as far back as 1798. In 1870 there were distinct differences among scientific authorities as to the true weight of a given volume of water, and it was for this reason that it was deemed inadvisable to re-enact in the Weights and Measures Act of 1878 so much of the act of 1824 as fixed the weight of the cubic inch at 252.458 grains. The experiments at the Standards Office have now at last landed us in the conclusion that water is not quite so heavy as the act of 1824 declared it to be, the cubic inch only being equal to 252.286 grains. The excess is only about 1-6 of a grain in a cubic inch, but a "note attached to the report rightly specifies the old estimate as erroneous for scientific purposes." It is of some interest to observe how far the new value effects the old reckoning. Water is a shade lighter than we thought it to be, so that we lose nearly 48 grains in the gallon, net 70,000 grains giving place to 69,952, or else we must give the gallon greater capacity. In a cubic foot of water we lose 297 grains, or nearly 3-4 of an ounce. The pint, considered as the 1-8 part of 277.274 cubic inches, drops from 8,750 grains to 8,744, creating a loss of 6 grains, or more correctly, 5.96. The excess has not been much, and yet it is to be regretted that the matter was not set right at first. The table of our weights and measures has now to be amended to this extent, that a gallon of water weighing ten pounds requires a capacity of 277.463 cubic inches, instead of 277.274, the enlargement being rather less than 1-5 of a cubic inch. The capacity of the pint becomes 34.683 inches, instead of 34.659.

THE ICE CREAM MYSTERY.

BEWARE OF TONKA BEAN ICE CREAM.

A druggist of this city, known throughout the State as a careful and conscientious member of his profession, offers a possible solution of the mystery of ice cream poisoning. His investigation in the Glastonbury case revealed the fact that the ice cream made in the same freezer, but flavored differently, caused no poisoning, while those who ate of a particular lot of vanilla cream were all more or less affected. This led him to believe that the trouble was in the "vanilla" flavoring, and he succeeded in procuring a bottle of extract that was used on this occasion for examination. So far as it was possible to ascertain without a chemical analysis, the "vanilla" extract contained not one trace of the true vanilla bean, but was simply a strong extract of "tonka" bean, or, as it is sometimes called, "snuff" bean, which is poison, although to the uninitiated it has a similar odor and taste to vanilla. The "tonka" beans sell for about $1 a pound, while the best vanilla beans cost from $15 to $20 a pound. Another fact in the Glastonbury case which was peculiar, was this: There was one lot of vanilla cream made in the same freezer, but flavored with another make of extract, which did not cause sickness. The druggist could not obtain a sample of the last extract, for no one seemed to know where it was obtained. The conclusion that the druggist arrived at was that all the mischief was caused by tonka beans, which unprincipled dealers sell for vanilla. It isn't well or safe to buy cheap extract of "vanilla."—*Hartford Courant.*

SUNLIGHT.

THE VALUE OF LIGHT FROM A HYGIENIC STANDPOINT.

All life on earth depending on sunlight, and the development of all organic beings being influenced by it, ancient physicians knew that protracted absence of natural light was not indifferent hygenically. Thess., Hippocrates, Galenus and Avicenna. Experimental investigation of this subject, however, does not begin, it seems, before our century. W. F. Edwards (Les Agents physiques de la vie, 1825) found that frogs and quabs developed normally in transparent vessels, while, when kept in entirely dark vessels, their growth was slower and their development not entirely normal. Molesthott, Fubine, Ronchi and others observed that epidermis in light secretes more carbonic acid than in dark, and Von Platen found that at the same time absorption of oxygen is greater. Consequently, sunlight increases carbonic rotation of matter. According to Loeb, sunlight only acts stimulating from the *eye* on the nerves which influence the rotation of matter. This is not so. It is rather probable that light exercises the same influence from the sensible nerves of the exterior *skin.* But even portions of tissue, entirely separated from the body (nervous and muscular mass) yield more carbonic acid in light than in the dark, and blue and violet light possess a much stronger action than yellow and red light. This actually compels us to suppose a chemical action of sunlight in the animal body, besides its stimulating action on the nerves. Such a chemical action may be found to take place in the deposit of dark coloring matter in the Rete Malpighu, in the browning of the skin, in the formation of freckles. The hygienic importance of light is also visible in psychic affections, disposition, etc. On a sunny day every healthy person is gayer, more cheerful; on a dark day, more serious and depressed. People of morbid irritability, also those affected with acute fever, are considerably more excited by clear light; they become quieter by dim, especially blue or green light. The eye is strongly excited by direct rays of the sun; they are able to cause central scotoma and retinitis. On the other hand, too small a quantity of light imposes an increased effort on the active eye—compels it to bring itself nearer to the object observed. Of the highest importance is another property of light: It contributes to the purity of air. Especially under the influence of the yellow rays living plants absorb carbonic acid with the apertures of their leaves, decompose it and exhale oxygen. It is probable that sunlight also favors oxidation of organic substances present in the air. Direct sunlight has the property of killing certain microparasites and their germs, as demonstrated by Arloing and Duclaux—*e. g.*, cultures of anthrax-bacillus in two hours, when sporiferous in 25-30 hours. Lymph, when preserved in light, gradually loses its virulence. Even the locomotion of microparasites seems to depend on sunlight; Engelmann observed it in bacterium photometricum. Merulius lacrymans (house fungus) develops its mycelium in darkness only, and in the real stage of growth it does not support light, which it only searches in the stage of putrefaction. Lack of natural light is particularly injurious to children, as illustrated by scrofulosis, rachitis. Malaria also appears to originate easier in dark houses. Every dwelling, therefore, should be provided with a sufficient quantity of sunlight during a part of the day as long as possible. The sunniest among the rooms should be selected for actual habitation, especially of children. Direct sunlight should not be excluded to a greater extent than necessary for the safety of the eyes. In plans for streets, schools, asylums, etc., hygienic technics and hygienic regulations should follow these principles.—*Deutsch Medizinal-Zeitung.*

To Prevent Slipping Belts.—One good way to prevent belts from slipping is to paint the face of the pulley. This can be done by using hot asphaltum or white-lead made very thin with turpentine. It will adhere well if allowed to dry thoroughly. A thicker coat of white-lead and oil should then be applied and allowed to dry thoroughly before being used. These coatings will not scale off if properly applied.

A Collapsing Republic.—The Argentine Republic, South America, has nearly 4,000,000 inhabitants, 25,000,000 cattle, 71,000,000 sheep, 4,500,000 horses and live stock worth $367,000,000. The country contains 515,000 square miles, divided among 14 states. It has mines of gold, silver, lead, tin and copper, and its forests abound in costly woods. The paper currency has been inflated to $160,000,000, and the banks are not compelled to redeem their bills. The ingoing farmers are assisted by the government, and they are all mortgaged heavily at the start. The national debt is $336,341,442. with an interest charge of $16,025,000 a year. The total debts of the nation, of the provinces and of Buenos Ayres City are $574,068,446. A financial collapse is imminent.

Keep Your Own Counsel.—Some one has said that boasting of what you will do is as unwise as to advertise your prosperity. If your plans are good ones, some one else will catch them up and be in the field in time to divide the advantage with you. If they are not good, you may be certain no one will point out the errors in them, so that you cannot possibly gain aught by your communicativeness. The men who listen well, and are not in haste to impart their own secrets, are the ones who generally get along in the world.

Value of Earth Worms.—Darwin estimated that worms, by swallowing earth for the sake of the vegetable matter it contains and forming castings, bring to the surface as much as ten tons of earth per annum on an acre. Worms are great promoters of vegetation by boring, perforating and loosening the soil, and rendering it pervious to rain and the fibers of plants, by drawing straws and stalks of leaves and twigs into it, and, most of all, by throwing up such infinite numbers of lumps of earth called worm casts, which form a fine manure for grain and grass. The earth without worms would soon become cold, hard-bound, void of fermentation, and consequently sterile; this has occurred in many cases where the worms have been either accidentally or intentionally destroyed, and the fertility of the soil thus lost has only been restored when the worms had again collected and resumed their fertilizing work.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

April.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, cod, snipe, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, perch, rock-fish, salmon, smelt, whitefish, trout, sturgeon.

VEGETABLES.—Artichokes, beans, carrots, celery garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

FRIED CODFISH.—Cut a piece of fresh codfish into slices two inches thick; dress plentifully with eggs and bread crumbs and fry in plenty of sweet lard or olive oil; season and serve.

CAULIFLOWER SALAD.—Boil a cauliflower in salted water until it is tender; take it up and drain. When cold, divide it into small pieces; arrange them in the centre of the salad dish and garnish with strips of pickled beef. Pour mayonnaise dressing over the cauliflower, and serve.

SWEET POTATO ROLLS.—Boil two large fine sweet potatoes and mash them through the colander, with a good tablespoonful of butter or lard. Sift two quarts of flour into a bowl; make a hole in the centre, and make a sponge with two beaten eggs, a cup of yeast, some cold boiled milk and the potatoes. Salt. Let it stand an hour, then knead. When it is quite light, roll out and cut into small cakes. Let them rise again, then bake.

RICE BLANC MANGE.—Boil one-half pint of rice in water until it is nearly soft; pour into it one pint of rich milk and boil to the consistency of stiff mush, stirring constantly; sweeten with a cupful of sugar and flavor with vanilla or rose water to taste. Dip a mold in cold water; put in the blanc mange, and when it hardens turn out on a dish and serve with preserves, cream and sugar or custard.

RABBIT STEW.—Cut up a rabbit and put it with a few slices of bacon and three or four sliced onions into a stewpan; add pepper and salt; cover it close and let it stew two or three hours. Soak one pound of rice for several hours, then boil it in a small quantity of water for ten minutes and stir it gently into the stew.

RICE MUFFINS.—Sift into a bowl one pint of flour into which has been sifted one teaspoonful of baking powder; add one tablespoonful of butter or lard, one teaspoonful of salt, one cup of cold boiled rice, two well-beaten eggs and enough milk to make a good batter. Bake on a griddle.

GINGER FRUIT CAKE.—Four eggs, whites and yolks, beaten separately, one cupful of brown sugar, two cupfuls of New Orleans molasses, one cupful of butter, three-quarter cup of sour milk, one teaspoonful of soda dissolved in the milk, two tablespoonfuls of ginger, one-half pound of chopped raisins, one-half pound of dried currants, one teaspoonful each of cloves, cinnamon and allspice; sprinkle the fruit well with flour, to keep it from settling in the cake; one quart of flour; add the whites of the eggs last and bake for an hour and ten minutes.

CHRONIC HYPNOTISM.—An officer in Italy, who had been hypnotized at a public seance, became almost insane. He would have attacks of spontaneous hypnotism when attracted by any shining object; and once, when following a carriage with bright lamps, came near losing his life.

SWEAR NOT AT ALL.—The students of Durham University have been discussing the effects of swearing. One held that it was beneficial when used in moderation, that the oaths that are used have no profane or evil intent, and that swearing is preferable to smashing furniture or abusing friends.

ART CULTURE.—Mr. Highart—"Yes, I believe in the cultivation of art among the masses. Artistic taste no matter where found or in what walk of life, is of incalculable value to the possessor." Mr. Hundrum—"Well I differ with you. My wife spent $80 last year taking art lessons, and then, Christmas, she gave me five boxes of cigars—selected by the pictures on the cover.—*New York Weekly*.

WOOL IN AUSTRALIA.—The *Illustrated Sydney News* states that one of the wool companies there has a burring machine recently imported from America which effectually eradicates all burrs and other extraneous matter from sheep skins, and its work is done in the most complete manner; skins thickly matted with burr and seed are put through this machine and turned out clean and free, without doing the slightest injury to the wool, while its value is materially enhanced. This is a great acquisition to the company in their fell-mongering department, enabling them to treat the very worst class of skins in a complete and satisfactory manner. There is also connected with these works a tannery on an extensive scale, where from 200 dozen pelts per week are converted into basils of a high class, for which there is a ready market.

RICKETS.

Rickets is a common malady of infancy and childhood. Attention was first drawn to it, in 1650, by Glesson, who spoke of it as a disease of children that had been known to be endemic for thirty years in Somersetshire, and had been brought from the country to London. It is very common in all great cities. In Vienna it is still known as the "English illness." A child developing this error of growth becomes profoundly affected in its health generally. It is tender all over, dislikes to be touched or handled, throws off the bed clothes even in cold weather, perspires profusely about the head, moves its head restlessly in sleep, so as even to wear the hair off, and in its waking hours sits perfectly still and subdued under a kind of suffering which can be but half realized by its consciousness. Such children give little trouble, seldom crying even when left alone. They are very sensitive to cold, and proportionately liable to catarrh; their nervous impressibility also is heightened, making a peculiar liability to convulsions and to laryngismus stridulus. They are "backward children," and, in particular, late in getting their teeth. The conspicuous error in such subjects is in the growth of the bones everywhere throughout the body. The ricketty condition often begins in children who are plump and apparently well nourished; and if the nutritive and other processes are involved at length, it is the osteoplastic process that is primarily at fault. Although rickets may have its origin, at least in some instances, during intra-uterine life, it is seldom that it can be recognized until several months after birth, and it most commonly attracts attention about the end of the first year. The symptoms which precede the outward manifestations of the disease are marked disorders of the digestive and alimentary functions. The child's appetite is diminished, and there is frequently vomiting, together with diarrhœa or irregularity of the bowels, the evacuations being clay-colored and unhealthy. Along with this, there is a falling away in flesh. Importance is to be attached, as pointed out by Sir William Jenner, to certain other symptoms present in the early stages, such as the sweating of the upper extremities (already described), the great tenderness of the bones, as shown by the pain produced on moving or handling the child. The urine contains a large amount of calcareous salts. Gradually the changes in the shape of the bones become visible, at first chiefly noticed at the ends of the long bones, as in those of the arm, causing enlargements at the wrists, or in the ribs, producing a knobbed appearance at the junction of their ends with the costal cartilages. The bones also, from their softened condition, tend to become distorted and misshapen, both by the action of the muscles and by the superincumbent weight of the body. Those of the limbs are bent outwards and forwards, and the child becomes "bow-legged" or "in-kneed," often to an extreme degree. The trunk of the body likewise shows various alterations and deformities, owing to curvatures of the spine, the flattening of the lateral curve of the ribs, and the projection forwards of the sternum. The cavity of the chest may thus be contracted, and the development of the thoracic organs may thus be interfered with, as well as their functions more or less embarrassed. The pelvis undergoes distortion, which may reduce its capacity to a degree that, in the female, may afterwards lead to serious difficulties. The head of the ricketty child is large looking in its upper part, the individual bones of the cranium sometimes remaining long ununited, while the face is small and ill-developed, and the teeth appear late and fall out or decay early. The constitutional conditions of ill health continue, and the nutrition and development of the child are greatly retarded. The disease may terminate in recovery, with more or less of deformity and dwarfing, the bones, although altered in shape, becoming firmly ossified, and this is the common result in the majority of instances. On the other hand, during the progress of the disease, various intercurrent ailments are apt to arise, which may cause death, such as the infectious fevers, bronchitis and other pulmonary affections, chronic hydrocephalus, convulsions, laryngismus stridulus, etc. The treatment of rickets is necessarily more hygienic than medicinal, and includes such preventive measures as may be exercised by strict attention to personal health and nutrition. The greatest care and watchfulness is necessary as to diet. When the disease is showing evidence of advancing, it is desirable to restrain the child from walking, as far as possible; although this restraint may be obviated by properly constructed splints and supports. One of the best adapted medicines for such cases is Dr. J. C. Ayer's Sarsaparilla, prepared by J. C. Ayer & Co., of Lowell, Mass. It is an alterative and tonic which, by removing effete matter and hereditary contamination, makes room for the proper assimilation of nutriment—the great essential in the treatment of rickets.

BUSINESS NOTES.

GORDON & DILWORTH.

Nothing too good for our trade seems to be the motto of this firm. Ever on the alert to attend to the minutest detail of their business from the purchasing of the best and freshest fruits and the purest sugar, through the various processes of manufacture, the most scrupulous cleanliness and neatness, the latest improved appliances and machinery, the best methods of packing and handsomest labels, no matter what it costs, are utilized to turn out their brand of goods. Only one brand of Gordon & Dilworth, and that the best only, is used; and notwithstanding all this, these preserves, jams, sauces, pickles and hundreds of other products are sold at much less prices and better than the most economical and skillful housewife can prepare them.

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CONTENTS.

FOOD ADULTERATION IN CONGRESS.

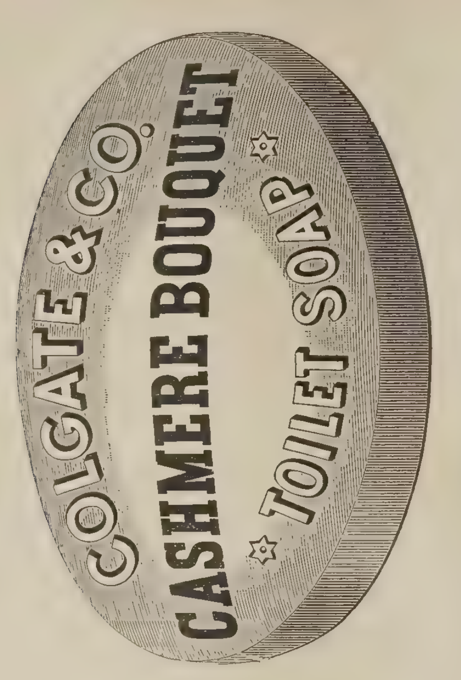
The indications at present, we regret to say, are unfavorable for any general legislation during the present session of Congress for the prevention of food adulteration. The Conger bill recently described in detail to the readers of the American Analyst, imposing a tax of one mill per pound upon compound lard, is on the calendar of the House and may get through, but the chances for anything further are dubious. The Senate has recommitted the bill reported by Senator Sherman providing for inspection of foreign exports. Until this measure is acted on, the Committee on Agriculture is not disposed to press Senator Paddock's bill to prevent the adulteration of foods that are the subject of commerce between the States. The members of the House Committee, with the Conger bill on the calendar and the Senate doing nothing, seem disposed to wait. General legislation presents difficulties with which some of the members are reluctant to cope until they have accomplished something in regard to a single product. A proposition to supervise all adulterated food products would bring such a lobby of remonstrants to Washington that life would be a burden to every member of the Committee. Some of them think it better, therefore, to attack the deleterious products in detail rather than in mass, and are content to rest for the present upon the compound lard bill. The constitutional difficulties in the way of general legislation have deterred many members from urging it; but the bill of Senator Paddock, which was prepared with considerable care at the Department of Agriculture, seems to meet the constitutional difficulty. The principal difficulty it suggests is in regard to the expediency of setting into activity an army of federal officials empowered to enter and inspect every shop and factory in the country. We explained the leading features of the bill in our issue of March 20. It probably is undeniable, however, that Congress has the power to regulate Inter-State commerce in food products, and such regulation could hardly fail to have its effect upon articles produced for consumption within a State as well as upon those exported to another State. If Federal regulations required a stamp of purity upon the exported articles, purchasers would soon come to insist upon having articles with the same stamp sold to them within the State. Unfortunately there is not the same demand for legislation in behalf of the consuming public that there is for special legislation for the benefit of particular interests. The farmers want the Conger bill passed to increase the price of hogs, and they are likely to get it. If the producers of pure food products are equally intent upon putting a stop to adulteration, they may sometime obtain the necessary legislation. We have fought for such a result for the past six years, and we shall stand to the effort until it is successfully accomplished.

CENSUS CONFIDENCES.

Some criticism has been indulged in recently regarding the questions to be propounded by the census officers this summer as to who are suffering from chronic or acute diseases, and the nature of the diseases. Such criticism, however, is uncalled for. The particular inquiry referred to was long ago adopted as relating to an important element in social statistics, in order, among other things, to show the prevalence of disability from sickness due to particular localities, occupations, ages, nationalities, etc. It includes, in fact, the enumeration of that class of population which is not only unproductive, but a direct and special burden upon the wage earners of the country. The propriety of including this inquiry is attested to by the fact, cited by the *Press*, that it was recommended as an addition to all census population schedules by the St. Petersburg International Statistical Congress; it was included in the last two Irish censuses, in the last Australian census, in the Hungarian census, in the last census of Massachusetts, and in the last census taken in the United States. The main point is to ascertain the number who are disabled from their ordinary employment by reason of acute diseases, such as malarial or typhoid fevers, or by reason of chronic lung disease or consumption, or tumours of various kinds, or chronic rheumatism, or the results of injuries, such as fractures, etc., because such information is very valuable from many points of view, and although the figures for any one group will not be absolutely accurate, the deficiencies will be in about the same proportions everywhere, and hence the results in different groups will be fairly comparable with each other. No blunder has been made in following the recommendations of the most eminent statisticians of this country and of Europe in placing this question in the schedules, and the great mass of people in this country are far too intelligent not to appreciate the value of information which will be derived from a comparison of answers given and the importance of making such answers as accurate as possible, especially as they well know that their answers as regards each individual will be treated as absolutely confidential, and that only the numbers will be published.

METALLIC CONTAMINATION OF FOOD.

Dr. Chas. M. Cresson has presented to the Philadelphia Board of Health a report embodying the result of an examination of certain samples of vegetables preserved in glass jars, having a loose plate of glass held in place by a metallic cap, over which is another ordinary stamped metallic cap. Dr. Cresson said that the "evident intention is to use a metal for the inside cap which is not effected by the preservative fluid or by the juices of the vegetables, and tin has been selected by the packer for the purpose. If pure tin had been selected it is probable that but little action would take place upon the metal; but unfortunately, the 'tin' employed on the jars examined contained the metal lead, and this metal has been dissolved to a greater or less degree by the preserving fluid. The asparagus and peas were notably contaminated with lead, and to a degree which I consider unwholesome. In addition to lead the Brussels sprouts contained copper, which was probably introduced either by boiling the vegetables in copper vessels or by the use of a copper salt for improving the color of the goods." The report went on to say: "Though, after all, a single dose be not mortal, yet a quantity of poison, however small, when taken at every meal, must produce more fatal effects than are generally apprehended, and different constitutions are differently affected by minute quantities of substances that act powerfully on the system. It should not be forgotten that the action of nearly all the metals, when introduced into the human system, is cumulative; that is to say, that the dose of one day is added to that of the day following, so that, however small and comparatively harmless the quantity of the metal introduced at a meal may be, the time at length arrives when the system becomes so impregnated as to occasion injurious and even poisonous results. This



view of the matter demonstrates the necessity of insisting upon the absolute freedom of all articles consumed as food from even the minutest amount of avoidable metallic contamination I think that the public should be advised of the danger that may be incurred by the use of this class of goods."

SOAP SYNDICATES AND SUITS.

A suit commenced by a firm of business brokers against Charles S. Higgins, the soapman, promises to throw some light on the methods of the so-called English syndicates in purchasing American industrial enterprises. It seems that in this instance Mr. Higgins named a large sum, a considerable share in the new company and a comfortable salary as the price of his soap factory, and conditions of selling the same to the Britishers. There was also said to be a guaranty of an eight per cent. earning capacity on the large capital required. But when the cautious Englishmen sent their accountant over to investigate the books, access was denied him. Of course the negotiations fell through and the brokers are suing for their commissions.

ROADS AND SOCIAL CULTURE.

An interesting and instructive discussion is in progress at present in which some of our learned citizens and both the lay and scientific press and some of the magazines are participating, in respect to the economic value in the United States of good country roads. The management of the Vanderbilt University has even gone so far as to provide for the free instruction in road engineering of one person from each county in Tennessee. The Baltimore *Sun*, which is agitating the question in Maryland, points out that the power required to draw a wagon weighing with its load one ton on a level macadamized road of broken stones is sixty-five pounds, which is increased to two hundred pounds on a common dirt road. Prof Ely, of Johns Hopkins University, estimates that poor roads cost the farmer, on an average, \$15 per horse, and Prof. Jenks, of Knox College, Illinois, argues that with good permanent roads freight could often be hauled ten miles on wagons cheaper than it could be taken one mile on a dirt road to a railroad station, unloaded, put on the cars, and carried to its destination. Of the social influences of good roads, he says that "a large part of the mental inspiration of the farmers depends on their ability to attend church lectures, concerts and social gatherings at a distance; and really good roads, by enabling them to go much more easily, would doubtless raise the whole intellectual tone of the farming community, besides keeping within the healthful influence of the farm many who are now forced into the towns."

CONNECTING THE CONTINENTS.

FROM PORTLAND, MAINE, TO PATAGONIA BY RAILROAD.

In a recent issue the Chicago *Tribune* says: "The proposed intercontinental railroad which is to connect North and South America, starting southward from the city of Mexico, is now supplemented by a proposition from H. C. Parsons, of Virginia, to build another road less than 2,000 miles in length, beginning at Cartagena, on the northern coast of Colombia, thence running south through Ecuador to Cuzco, in Peru, where it will connect with the road already building northward from the Argentine Confederation. A company has already been formed under a charter from the State of Virgina, and trustees appointed, the latter being Judge Granville P. Hawes, of New York; Ex-Senator T. M. Norwood, of Savannah, Ga.; John W. Thompson, a Washington banker, and A. W. Campbell, of Wheeling, W. Va. The first step to be taken will be the survey of the route, and for this a fund of \$500,000 has been raised. Great difficulties will stand in the way, especially among the mountains, as huge peaks will confront the surveyors in Ecuador and Bolivia; but in these days of science it is premature to consider anything insurmountable, and the success which has crowned the efforts of the builders of the roads running east and west in piercing the Andes with tunnels will be encouraging to the projectors of the north and south road. The new road, it is claimed, will pass through an exceedingly fertile country to the north, in many sections rich in gold and silver, and abounding in coal and timber. A considerable portion of the road will run through an almost virgin region, very sparsely populated, but once opened up the projectors are certain that its natural resources will attract a large colonization. The country penetrated by the road is one of the most picturesque in the world, and the enthusiastic projectors are confident that within five years it will be the favorite route of tourists, instead of the European. It will, at least, be a new experience when the traveler can purchase his through tickets from New York to Chicago, thence to the city of Mexico, through Central America and down through the wild scenery of the Andes to the heart of Peru, thence eastwardly through Bolivia, Buenos Ayres and Brazil to Rio Janeiro, and home by steamer to New York. For some time to come it is evident that human enterprise and energy will concentrate themselves upon the great work of opening up Africa and South America, the one to civilization, the other to commerce. England seems destined to accomplish the one, and the United States, if she is quick to seize her opportunities, the other.

BRITISH JAM.

A SWEET AND WHOLESOME SUBSTITUTE FOR BUTTER.

The cheapness of sugar in England has resulted in an enormous extension of the jam manufacturing business, and the consumption of jam has become almost universal. It is used by the poorer classes as a cheap and wholesome substitute for butter, costing from four to ten cents a pound less. The centres of the jam manufacturing are at London, Glasgow, and Dundee. During the season about 100 tons of soft fruit are made into jam in London each day. Every town of considerable importance has jam factories, the most of these having originated in recent years. Several years ago jam manufacturing began on a small scale in the city of Dundee, in Scotland, and already a single firm, that of Clarke, Nicholls & Coombs, employs over 1,000 hands. There are many firms in the manufacturing centres which turn out as much as 12 tons of jams and preserves a day. During the season of 1887, the single city of Glasgow received daily 30 tons of strawberries, besides large quantities of other fruits from one Scotch valley which lies between Hamilton and Lanark, and from this valley Dundee also draws a large part of its supply. So extensive has this industry become that the factories now consume about two-thirds of the entire small-fruit crop, and they serve also as a great stimulus to production. In 1887 there were more than 48,000 acres devoted to small fruits. In the county of Kent there are many growers who plant 100 acres in strawberries alone, and some who plant several hundred. About 50,000 persons in this county alone are engaged in the production of small fruits. The consumption of sugar by England's jam and preserve factories reaches the enormous figures of 300,000,000 pounds annually.

NEW JERSEY ADULTERATIONS.

OFFICIAL REPORT OF THE STATE COMMISSIONER OF ANALYSES IN 1889.

The report of food adulterations for the year 1889 of the State Dairy Commissioner of New Jersey has been published, from which we condense the following:

During the past year 968 official notices were served on dealers in food products, many of whom accepted the offers of the State Board of Health to analyze articles of doubtful quality. The Commissioners secured as analysts Prof. Henry B. Cornwall of Princeton, Mr. Shippen Wallace of New Brunswick, and Mr. Joseph F. Geisler, official chemist to the New York Mercantile Exchange. During the year 2,507 articles of food were analyzed; of these 1,405 were pure or equal to the legal standard, and 1,102 were adulterated within the meaning of the act. This shows that 56.04 were pure and 43.96 were adulterated.

One hundred and seven samples of imported canned goods were examined, of which 88 were found to be adulterated or not standard. These latter were 2 out of 4 samples of beans and 86 out of 96 samples of peas.

The chief adulterant found in these articles was copper, which was added to give a green color to the vegetables. No adulteration or harmful ingredient were found in American canned goods.

Fifty samples of ground coffee were examined, of which ten were pure and forty adulterated. The adulterating materials were roasted and ground peas, beans, rye, wheat, bread, and chicory. The following were the names on the packages containing adulterated coffee: Philadelphia Coffee Blending Co., Limited, "Blended Coffee;" Scull & Wireback, Philadelphia, "Daisy Rio Coffee," "Blended None Such;" Davison, Silvers & Co., "American Breakfast Coffee," "Old Shilling Coffee;" "Wood's Brazilian Coffee," "Centennial Java," "French Breakfast;" Thomson & Binns, Philadelphia, "The Leader;" Wm. S. Scull & Co., Philadelphia and Camden; Jarrett & Keim; Atlantic and Pacific Tea Co.; "Eight o'Clock Breakfast;" Oriental Spice Mills; Maynard & Irvin, Boston.

Eleven samples of teas were examined, all of which were pure.

Six hundred and forty-nine samples of ground spices were examined, of which 343 were standard or pure, and 306 were adulterated or not standard. The adulterants noticed were of the same character as outlined in former reports. It is to be remarked, in this connection, that a ground spice may not contain any added material or adulterant, and yet be of such poor quality as to be as fraudulent as the sophisticated article. In many instances the spice has been packed for so long a time as to have lost all flavor; in these cases I think these debased articles should be classed among those not standard. The following table will show the number of each of the spices examined:

	Total	Standard	Not Standard or adulterated
Allspice	39	34	5
Cloves	59	29	30
Cassia	121	84	37
Ginger	25	20	5
Mustard	92	13	79
Mace	12	5	7
Nutmeg	2	2	0
Black pepper	217	129	128
White pepper	18	10	8
Cayenne pepper	24	17	7
	649	343	306

The following were the names on packages containing adulterated articles: Java Mills, Reeves, Parvin & Co,; Batavia Mills, Wm. S. Boyd & Co.; Metropolitan Mills, A. Colburn, Ohio; Anchor Brand, Bohsemeen, Davison, Silvers & Co.; Coleman, Pioneer Mills.

One hundred and eleven samples were examined, of which twenty-eight was pure and eighty-three were adulterated. The adulterant was either glucose or cane-sugar syrup. The following names were on the packages containing the adulterated honey: Wm. Thompson, Wayne County, N. Y.; Chas. Israel & Bro.; Sleeper, Wells & Aldrich, Burlington, N. J.; Philadelphia Pickling Company; Hildreth Brothers & Segelken, New York; McCaul & Hildreth, N. Y.; C. G. Leslie & Son, Pittsfield, Mass.; Leslie, Dunham & Co., Pittsfield, Mass.; Newark Manufacturing Company: Austin, Nichols & Co., New York; E. C. Hazard & Co., N. Y.; G. D. Powell; E. A. Walker & Bro.; George Boyd & Son, Philadelphia; John Long, N. Y.; Wm. Collins, Worcester, Mass.; C. A. Aaronson & Co., Philadelphia; P. J. Ritter Company.

Twenty-four samples were analyzed, of which twelve were pure and twelve adulterated with molasses or cane sugar. The following names were on the adulterated samples: Israel & Brother, Hildreth Bros. & Segelken.

Sixty-four samples of molasses were analyzed, of which twenty-six were pure and thirty-eight adulterated. The chief adulterant was glucose. Some samples had been bleached by the use of sulphurous acid, and some contained tin.

Thirty-seven samples of vinegar were examined, of which sixteen were equal to the standard of 4.50 per cent. acetic acid, and twenty-one were not equal to the standard.

One hundred and ninety-two samples of fruit preserves were examined, of which thirty-three were pure and 159 adulterated. The preserves were either in the form of jelly or jam. The following table will show the names of the fruits printed on the labels and the number of samples examined:

	No. Examined.	Pure.	Adulterated.
Raspberry	28	4	24
Red Currant	71	6	65
Quince	16	1	15
Apple	4	4	0
Orange	3	0	3
Strawberry	25	4	21
Apple Butter	3	2	1
Plum	8	2	6
Crab Apple	1	1	0
Pineapple	4	0	4
Peach	9	2	7
Blackberry	4	3	1
Cranberry	2	0	2
Cherry	9	2	7
Grape	1	1	0
Lemon	1	1	0
Unknown	3	0	3
Total	192	33	159

The following names appeared an the labels of the adulterated articles: J. O. Schimmel Preserving Co., Orchard Preserve Works, Greenwich Packing Co., New Jersey Preserving Co., Erie Preserving Co., Max Ams, F. & J. Heinz, Empire State Preserving Co., Curtice Bros., Gotham Packing Co., Joseph Campbell & Co., P. J. Ritter Preserving Co., C. Vollers, Chas. Israel & Bro. At the time this investigation of the fruits, jams and jellies sold in this State was begun it was thought that the adulteration would be detected, for the cost of fruit and cane sugar was so low that little incentive for sophistication appeared to exist. But before our work had advanced very far it was ascertained that the greater portion of the cheap articles were not only adulterated, but many were devoid of any of the fruit mentioned on the label. The presence of foreign colors, glucose and materials to make up the bulk of the article was easily detected. Now let us see how the articles of an inferior kind depart from the standard above outlined:

(1.) A jelly or jam may be made of pure fruit and sugar, yet a mixture of several kinds of fruit. This variety is put up by some packers who have large quantities of inferior articles that they do not wish to pack under their first-class labels. This quality is perfectly pure and healthful, and contains no injurious material, the only deception being in the name on the label.

(2.) Jellies are often mixed with gelatine, or Japanese isinglass; this is to give the article body, and also to make up inferior grades.

(3.) Jellies and jams are made of apple pomace as a base, mixed with other kinds of fruits.

(4.) Jellies and jams are also made up of apple pomace, starch, glucose, and some fruit to fix flavor and color.

(5.) These articles are also made up with apple starch, artificial flavors, aniline colors and acetic acid.

The following table will show the articles used in the fraudulent jams and jellies:

Articles used to give substance: Apple pomace, apple juice, starch, glue, gelatine, Japanese isinglass.

Articles used as flavors: Apple, inferior or spoiled fruit juices, artificial flavors and the compound ethers, acetic acid.

Artificial colors used: Aniline dyes, eosine, fuchsine, Bismarck brown, garnet red, ruby red, and various carmines.

Ten samples of pickles were examined, three of which were pure and seven contained copper.

Thirteen samples of baking powders were examined. The following brands contained alum: Davis's, Silver Star, Aunt Sally, Kenton, Homestead, Phosphate Health, Empire.

Prof. H. B. Cornwall reported on the following brands that had been omitted from the report of 1888: *Phosphate Health Baking Powder*—It contains carbonic acid gas, 13.49 per cent. It yields reactions for ammonia, soluble sulphates, phosphoric acid, lime and alumina. The powder has all the properties of a phosphate and alum powder. *Empire Baking Powder*—It contains 9.07 per cent. of carbonic acid. It gives reactions for ammonia, alumina, sulphuric acid and phosphoric acid, and is to be classed with phosphate and alum powders. *Excelsior Baking Powder*—It contains 15.12 per cent. carbonic acid, and consists almost wholly of free tartaric acid combined with carbonate or bicarbonate of soda.

Twelve samples of bologna and smoked sausage were sent me from Trenton and Jersey City, with the statement that some substance had been used in their preparation that was injurious to health. An investigation was immediately begun, and as the process employed in the manufacture of these articles of food was improper and in violation of the law regulating the sale of food, notices were issued warning all dealers that if the adulterated products were offered for sale in this State, charges would be entered in the courts against them. As a result of this course the sale of the injurious articles was stopped. The investigation revealed the following facts: The analysis of the bologna and the skin in which the meat was placed showed that some dye, probably one of the anilines, was used to color the material, in order that some defect might be hidden or the article made to appear better than it really was; also that some substance had been applied to the exterior of the sausage similar to varnish. Further analysis revealed the presence of triamidoazobenzine, or Bismarck brown, one of the aniline colors; this was in the meat. The skin or "casing" was coated with a varnish containing shellac. This discovery was the means of arriving at all the details of the process employed. The sausage in question was prepared in the following way; After the meat was chopped and the sausage-meat thus prepared put into the casings, the sausage was boiled in a bath containing a portion of the following coloring agent: Bismarck brown, 14 parts; garnet red, 2 parts; water $1\frac{1}{2}$ pints. This gave the sausage a brown color. When this process was complete the sausages were coated with a varnish composed of shellac, resin, oil, and alcohol. In order that the small local manufacturers of sausages, might engage in the practice of making dyed sausages the compositions referred to above were offered for sale through the State, and the straining material was sold under the name of "smokine" or "liquid smoke." The sale of this article was checked by the official action of the inspectors throughout the State.

CHEAPER DRUGS.

THE ADVANTAGE OF BUYING MEDICINE BY ITS ENGLISH NAME.

All the large drug firms print and distribute catalogues and price lists of their drugs. Most of these catalogues contain almost all the standard prescriptions. The formulas for the most frequent diseases are printed in these pamphlets, with the quantities of the doses, and the prices at which the pills, powders or liquids are sold to the trade. Every doctor has several of these price lists, and every drug store has a pile of them. A man who has any of the ordinary ailments will find his prescription repeated in one of these price lists. The difference is that the price list usually gives the ordinary names for the drugs used, while the prescription is written out in a way which only a doctor or a drug clerk or a man who has picked up the knack of it can understand. The difference between the prices in the price lists and the prices at which the goods are sold is from 400 to 2,000 per cent. If a man gets medicines often and can find a friendly disposed doctor, he can save a great deal on the price of his prescriptions. The thing to do is to have the doctor write out the prescription in English, or to give him a copy of one of these pamphlets, with the pill, powder, or whatever it may be, marked. He learns the name of it by heart, then he goes to a drug store and asks for what he wants instead of handing in a prescription for it. This is a simple thing to do, and will save from one-half to three-quarters the price.—*Sun.*

ELECTRIC LIGHTING.—The first German Catholic church to be lighted electrically is the grand old cathedral at Strasbourg. Arc lights have been used outside with fine effect, and it is stated that many of the noble lines of the architecture are accentuated by night as they never have been by day. It was feared that the electric light would spoil the dim, religious effect of the interior, but the light of the incandescent lamps which are disposed around the piers and columns is described as soft and harmonious.

POISON IN THE BROOM.—Says a broom corn dealer: "A few years ago, all broom corn was so bleached with sulphur fumes as to make it so white that it nearly destroyed its pliability, and it sometimes broke to pieces much more rapidly than it should have done. Now the broom-makers have gone to the other extreme. They dye their broom corn so green that housekeepers are afraid to break off one of the splints to test a cake with, for fear they may be poisoned with Paris green." "Why do they do so?" he was asked. "Well," said he, "I don't know exactly, but I suppose styles must change. Then, again, the housekeepers may have found out that the white brooms didn't wear so well, and caused a demand for green ones." 'But are they really dyed with Paris green?" "I can't say as to that. It does'nt look like it to me, but I'd rather be on the safe side and not eat any of it."

CORRESPONDENCE.

FLOWERS, FASHION AND DECORATION.

LONDON, *March* 20.

Editors AMERICAN ANALYST: The past season in this metropolis has not been so brilliant as usual. February was still suffering from relapses of the influenza epidemic; therefore that, combined with the Lent season, has made entertainments few and far between. There have been a few dinner parties, the principal features in their adornment being yellow narcissus, mimosa, and fern leaves. This is a very pretty combination, the mimosa giving a graceful and light effect; mauve orchids and yellow narcissus have also been combined together. Violets and daffodils and white jonquils with pink azaleas. The decorations are still arranged low and often in the middle, the center piece is done away with and merely a mound of flowers in its place, and here and there an electric light peeps out. Old silver is still de rigueur. Relays of small old silver candlesticks are often placed on the sides of the table with pale rose-colored or canary-colored shades on the candles. At a small function that I was at a few nights ago, there were several silver bon-bon dishes, some surrounded with circles of the small yellow narcissus and others with the same flower arranged in star-like form around them. In and out between these were little bowls filled with narcissus and maiden hair fern. It is said that heliotrope blended with La France roses will be the chic decoration this summer, with the addition of a little spiræa here and there mixed in. The sac de fleurs is still favored, made of brocaded silk or satin in the shape of a reticule and tied up with cords and tassels. Lilies of the valley in old gold-colored sacs look very unique. Mantlepieces in ballrooms are so arranged that the flowers seem to be growing, and indeed, on many dinner tables the flowers are stuck into miniature china pots as if growing in them. Glass will be more considered than ever this season, and the Siamese troughs, resembling half dozen miniature fish globes fastened together, will be great favorites, they are so suitable for spring flowers and look so well around a handsome plateau. The stands for grapes which had been so fashionable all the winter are placed at the corners of the table and the bunches hang down. The prettiest are those made in silver or electro, and have a pendant glass for flowers suspended from one arm and the grapes from the other. Great attention is being made to the decoration of side-boards now. People possessing good old plate place it far back on the sideboard and arrange in front flowers in cups of silver, and the silver pieces garlanded together with chains of flowers. Crescents of looking-glass, with an owl in the centre, and the inner portion of the crescent fringed with flowers, are new and effective. The china handkerchiefs are still occasionally used, and this winter were brought out again as Christmas decorations, filled with holly and mistletoe, and on Primrose Day, when so many dinners were given, they will be charming filled with primroses and forget-me-nots. Bon-bonnieres will be found generally placed before guests this season, and I hear they are preparing very quaint little devices for them.

D. S.

FLUID TEMPERANCE.

THE MORE YOU DRINK THE MORE YOU WANT.

A vegetarian lecturer once said in my hearing that he had gone a whole month without drinking one single drop of fluid—he found sufficient in the food he swallowed; and two ladies whom I was told about the other day by a gentleman in whose veracity I place implicit reliance, greatly astonished a large circle of people by going long excursions and taking severe and continuous exercise while living on nothing but porridge, fruit (mostly uncooked), and well-cooked vegetables. These ladies were untroubled by thirst, enjoyed the most vigorous health, and distanced many of their competitors. When cycling, the less fluid the better, and runs of many hours are practicable, even in the hottest weather, without indulging in any fluids. This I know from repeated experiments. The muscles speedily acquire a firmness and tone impossible when fluids are taken while exertion becomes a positive delight. This is no crotchet of mine but a solemn fact, and one being recognized by my brother cyclists, who are fast learning that the less fluid the better. Soldiers on review days in hot weather and in foreign climates have been gradually learning the same truth experimentally, and though when they have been greatly over-exerting themselves for many hours, they are not prohibited from taking fluids, they are cautioned to take very little. In this way the risk, always appreciable, of taking cold water in insanitary villages is avoided; though how many of the evils attributed to the badness of the water are really due to the amount of cold drinks imbibed? When the run is over then, then if you will, take a little fluid but not much: the more you drink, the more you want to drink, and nothing is worse for you. As for alcoholic beverages; every cyclist now knows that if he wants to cover a long distance he must avoid them like grim death, as perilous beyond words. So you see you need not take any portly flask or water bottles, and you need not encumber yourself with cold tea and flavorless coffee; you can set off absolutely unencumbered.—*Gentlemens' Magazine.*

GASTRONOMIC NOMENCLATURE.

TERMS USED IN COOKERY AND IN THE KITCHEN.

ASPIC.—A savory jelly.

ASSIETTE.—Small entrees and hors d'œuvres. Not more than a plate will hold.

ASSIETTES VOLANTES.—Dishes handed, and not put on the table.

ATELETS.—Small silver skewers used in garnishing.

AU BLEU.—Fish dressed in such a manner as to have a bluish appearance.

AU GRAS.—Dressed with meat gravy.

AU JUS.—In the natural juice or gravy.

AU NATUREL.—Plain simple cooking.

BABA.—Sweet cake.

BAIN MARIE.—A metal pan, which has a loose bottom, to hold hot water in, which smaller vessels can be put inside for keeping warm.

BAROLE.—A thin slice of fat bacon placed over steak, fowls, game, etc., instead of larding.

BECHAMEL.—A rich white sauce.

BEIGNET.—A pancake or fritter.

BISQUE.—A soup made of shell-fish.

BLANC.—White broth.

BLANCH, OR BLANCHIR.—To whiten poultry, vegetables, etc., by placing them into boiling water for a short time, and then thrown into cold water.

BLANQUETTE.—A white fricassee made with white sauce, thickened with yolk of egg.

BLIGNET.—To fritter anything in butter and egg, and fried.

BOUDIN.—A rich mixture of different meats.

BOUILLI.—Beef much boiled.

BOUILLON.—A thin soup or broth.

BOUQUET OF HERBS.—Parsley, thyme and other herbs tied together.

BOUQUET GARNI.—The same, with the addition of cloves.

BOURGUIGNOTE.—A ragout of truffles.

BRAISE.—Meat cooked with bacon in a closely covered stewpan to prevent evaporation, which greatly improves the taste.

BRAISIERE.—A saucepan with ledges to the lid.

BRIDER.—To truss fowls with a needle and thread.

BRIOCHE.—A kind of sponge cake.

BUISSON.—A cluster or bush of anything piled on a dish.

CALLIPASH.—The glutinous flesh of the turtle found on the upper shell.

CALLIPEE.—The same found on the under shell.

CANNELONS.—Small rolls of anything filled with meat, fruit or minces.

CAPILOTADE.—A hash of poultry.

CARAMEL.—Burnt sugar.

CASSEROLE.—A crust of rice, which, after being moulded to the shape required, is filled with fricassees or purees.

CIVET.—A dark, thick stew.

CHEMISE.—To line a mould.

COMPOTE.—Stewed fruits served with syrup.

CONFITURE.—Preserves, sweets, jams, etc.

CONSOMME.—Strong, clear gravy.

COULIS.—A rich brown gravy.

CROQUETTES.—Minces of meat, fish or fowl made into various shapes, rolled in egg and bread crumbs, and fried crisp.

COURONNE, EN.—To dish up entrees in the form of a crown.

CROUSTADES.—Fried shapes of bread, upon which various entrees are served.

CROUTON.—Fried sippets of breed for garnish.

DARIOLE.—A sweet tart baked in a mould.

DAUBE.—Meat, fowl or game stewed in sauce.

DAUBIERE.—An oval stewpan.

DESOSSER.—To bone poultry, etc.

DORURE.—Yolks of eggs used for covering different viands.

ENTREE.—Dishes handed round after the fish.

ENTREMET.—Dishes of sweets and savouries for second course.

ESCALLOPES.—Collops, small round pieces of meat, poultry or fish.

ESPAGNOLE.—Spanish sauce, very rich and brown.

FAGGOT.—A small bunch of parsley and thyme tied up with a bay leaf.

FARCE.—Forcemeat stuffing.

FARCIE.—Stuffed.

FEUILLETAGE.—Puff paste.

FINANCIERE.—A rich ragout.

FLAMBER.—To singe fowls or game.

FLAIR.—A French custard.

FONDER.—To line the bottom of a saucepan with slices of bacon.

FONDUE.—A cheese dish.

FRICANDEAU.—A dish made of lamb or veal, cooking it without bone.

FRICASSEE.—Chicken, etc., cut in pieces, with rich white sauce, etc.

FRITTER.—Anything made in batter and fried.

GALETTE.—A broad, thin cake; a kind of muffin.

GATEAU.—A cake.

GAUFFLES.—Light spongy biscuits.

GLAZE.—Stock boiled down to jelly.

GODIVEAU.—A variety of forcemeats.

GRAS.—Made with meat.

GRATIN.—A forcemeat made with meat and thin panee.

GRATINER.—To grill.

HARICOT.—A stew made with mixed vegetables and meat.

HORS D'ŒUVRES.—Small dishes of relishes, such as sardines, anchovies, caviare, served before soup.

JARDINIERE.—Vegetables stewed in their own sauce.

LARDON.—The piece of bacon used in larding.

LICAISON.—A mixture of cream and egg used to thicken with.

LIT.—Thin slices in layers, with seasoning between.

MAYIE.—Without meat.

MARINADE.—Liquor in which meat or fish has soaked.

MASK.—To cover meat over with forcemeat, sauce, etc.

MATELOTTE.—A rich fish stew made with wine.

MAYONNAISE.—Cold sauce or salad dressing.

MAZARINE.—An ornamental entree.

MENU.—Bill of fare.

MERINGUE.—Light pastry made with white of egg and sugar.

MIROTON.—Slices of meat larger than collops stewed in rich sauce, and dished up in a round.

MOUILLER.—To add broth or water during cooking.

NOUGAT.—A kind of caramel made with almond sugar and lemon juice.

NOUILLES.—Strips of paste made of eggs and flour.

PANADA.—A mixture of bread, milk, etc., used in making forcemeats.

PAPILLOTIERS.—Greased pieces of paper fastened over fish and cutlets.

PATE.—A small pie.

PAUPIETTES.—Slices of meat rolled.

PILAU.—A dish of meat or poultry and rice.

PIQUE.—Larded.

POELEE.—Stock used instead of water for boiling.

POTAGE.—Soup.

PRINTANIERS.—Early spring vegetables.

PROFITEROLLES.—Light pastry with cream inside.

PUREE.—Meat and vegetables reduced to a pulp, and then mixed with other liquids to make it the consistency of thick soup.

QUENELLES.—Forcemeats of different kinds formed into balls and poached.

RAGOUT.—A rich sauce.

RELEVE.—The remove dishes.

REMOLADE.—Salad dressing.

RISSOLE.—Minces of fish or meat inclosed in paste and formed into half-moon shapes.

ROUT.—A mixture of butter and flour used for thickening white soups and sauces.

SALMI.—A hash of game with rich sauce.

SAUCE PIQUANT.—A sharp sauce.

SAUTE PAN.—A thin-bottomed pan for frying.

SAUTER.—To dress in a saucepan with sauce, and constantly moving it about.

SERVIETTE, A LA.—Served up in a napkin.

SIPPETS.—Small pieces of bread cut into different shapes, then fried and used for garnish.

SOUFFLE.—A light pudding.

STOCK.—The broth of which soups are made.

TAMIS.—A strainer, or fine sieve.

TIMBALE.

TOURTE.—A tart baked in a shallow dish.

TRIFLE.—A sweet dish made of sponge cake, macaroons, jams, wine and liqueurs.

TROUSSER.—To truss.

A SHADY SCHEME.

THE HOT AIR CURE FOR CONSUMPTION A HUMBUG.

In the AMERICAN ANALYST for April 3d we exposed a pretended hot air cure for consumption, with an instrument devised by a Dr. (?) Louis Weigert. We then gave good reasons for believing the whole scheme to be a money-making humbug. We give below the summary of an interesting paper read by Wales L. Cary, M. D., Physician of the Brooklyn Throat Hospital, before the Medical Society of the County of Kings, at its meeting in Brooklyn. A perusal of these conclusions to be drawn from the statements of the paper will convince any one that this so-called Dr. Louis Weigert method of hot air cure for consumption is a snare and delusion, which may be very dangerous.

I. Comparative pathology and the natural history of pulmonary tuberculosis in man indicate that the most favorable temperature for the *intra-pulmonary* development of its bacillus is much higher than 99.5 deg. F.

II. Tubercular bacilli, in a favorable soil within an animal organism, are not attenuated nor their development arrested by temperatures which are inimical to them in artificial or non-vitalized culture-media, but even rendered more virulent and more rapidly reproductive.

III. Temperatures demanded for effective disinfection or discontinuous sterilization by dry heat are impracticable and injurious to the animal organism.

IV. It would appear that Dr. Weigert is mistaken in supposing that the residual air is heated much above 113 deg. F.; and that, in fact, there is but very slight, if any, elevation of the intra-pulmonary temperature. Recent advices from Germany inform us that accurate measurement of the actual elevation of the lung temperature is but ½-1 deg. F.

V. If it were possible to produce and maintain, even for a short time, an intra-pulmonary temperature approaching 113 deg., there would be produced, independent of the effect upon the lung-tissue, grave degenerative changes in the blood and entire cellular elements of the body.

VI. At temperatures far short of those claimed, there would be produced an auto-infection and accumulation of excrementitious products, by diminished respiratory capacity, directly deleterious to the organism at large, and indirectly embarrassing to those nutritive activities upon whose integrity all hope of permanent benefit to the consumptive must rest.

VII. The factor productive of the benefit arising from the Weigert method is the *dryness*, rather than the heat, of the inspired air; and this desiccating action cannot be obtained except the temperature of the inspired air be as low at the upper as in the deeper parts of the lung. Of further benefit are pulmonary gymnastics, the psychological effect, and possibly in some cases a favorable action upon the bacteria in the larger bronchi.

LIGHT PRODUCTION.

A BROAD FIELD SUGGESTED TO THE SCIENTIFIC DISCOVERER.

Within two years the wonderful experiments of Hertz have demonstrated beyond question that electromagnetic waves travel through space from every source of alternating currents or potentials, and that the waves travel with the velocity of light. In this city there are I suppose, many alternating current systems. When we think of these in action, we are apt to think only of the activity in the conductors of the machines, the lines, the transformers, the lamps, and yet we know that in all the space around there is activity. Waves are chasing each other through this room, through our streets, our houses, our offices. They are everywhere present. We are bathed in this agitated medium every moment, and yet we live, but are totally unconscious of the activity that surrounds us. No sense responds to the wave motion that fills this space. And yet, when these waves become short enough and frequent enough, they do affect our sense of vision, and a vast array of phenomena that otherwise would have had no existence for us are made known to us through this special sense. But the eye only responds to waves of $\frac{1}{70000}$ to $\frac{1}{37000}$ of an inch in length, while the length of the waves emitted by one of our alternating current systems is 600 miles. The waves that effect the eye must occur at the inconceivable rate of at least 400 millions of millions per second, while less than 300 waves per second are emitted from our alternating systems. These waves come very far short of the number necessary to effect any of our senses; but we have been able to demonstrate their existence; at least we have been able to show that something possessing all the characteristics of wave motion exists in the space around a source of alternating currents or potentials. It is something to know that waves of such enormously different lengths and frequencies exist in the medium that is agitated by waves of light. It is something to understand that our sources of alternating currents are centers of radiant energy, differing from light only in wave length; and since we have begun to appreciate this fact, we have often asked ourselves the question: Can the rate of alternation be increased until the whole apparatus should glow with light? Although the enormous rapidity required seems to render this direct solution impossible, it seems to me there must be a way to obtain the light we want without all this waste of energy. I cannot believe it will always be necessary to develop waves of all lengths from many miles down to a hundreth-thousandth of an inch, in order to obtain the narrow range of wave lengths by which we see. I do not know of any practical way of obtaining the few wave lengths that constitute light without at the same time producing the others, but it is done. The glow worms do it, the fireflies do it, the lantern beetles do it, and I believe the time is coming when man can do it. Instead of getting ten 16 candle lamps per horse power, we ought to get 200. I don't know how it is to be done. I don't expect we are going to make alternating machines to produce 500 millions of millions of alternations per second. But possibly we may solve the problem indirectly by the use of some substance having a special rate of vibration, such as the gases. Possibly we may be able to excite electrically the fluorescent salts. Possibly we may be able to charge and discharge a condenser and take advantage of the oscillatory discharge to set up vibrations of the frequency required. Possibly we may discover the secret of the glow worm and firefly and substitute electric for the insect energy. I know it will take several fireflies to equal a 16 candle lamp, but it will also take a good many fireflies to develop a horse power. But although I do not see at present any practical solution of the problem, I repeat, I believe the problem can and will be solved. We are not going on forever burning a coal mine whenever we want a little light. Neither are we going on forever converting the energy of coal into heat when it is mechanical or electrical energy we want. From the very nature of things, not more than one-fourth or one-third the heat so produced can be transformed into any other form of energy. The energy of fuel can he converted into mechanical energy without first becoming heat. It is so converted in every animal movement, the way exists; let us find it. Find this and the way to make light only when it is only light we want, and we shall have lengthened the life of our coal deposits five or ten times. The man who solves either one of these problems will be the greatest discoverer of this or any other age. If he gets a broad patent on it, he will have seventeen years of the grandest litigation the world ever saw.—*W. A. Anthony.*

ALL IN THE SAME BOAT.—Husband: These trousers that I want to wear on the fishing party have not a single suspender button on.

Wife (sweetly): Then, John, if your party is drowned I shall be able to identify your body from the rest.

Husband (savagely): No you won't either; the others are all married men like myself.

ITS USEFULNESS GROWING.—The Massachusetts Society is to utilize the phonograph in preserving the language of the Passamaquoddy Indians. Anything to preserve Mr. Lo and his language and customs for the benefit of our children. While we in the East are preserving his language in a phonograph, the post-traders in the West are doing their best to preserve his body in alcohol.

ENGLAND IN PERSIA.—According to private information from Persia, the competition of Russian traders with the English can already be considered as completely unsuccessfnl. It is said that Russia must consider the Persian market as lost forever if she do not without delay begin the construction of a railway from Baku to the Persian frontier, and simultaneously obtain the consent of Persia to the construction of a railway from that point of the frontier to Teheran.

AUSTRALIAN RABBIT PEST.—A good deal of interest is being centered in the colossal efforts made by the Victorian Government for the suppression of the rabbit pest in that colony. In upward of one hundred shires in the northern and western districts of the colony simultaneous action is to be taken for the destruction of the rabbits, in accordance with the Rabbit Suppression Act, recently adopted by the Legislature. Poisoned grain is to be largely used, and it is estimated that fully 75 per cent. of the rabbits will be killed.—*Pall Mall Gazette.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

April.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, cod, snipe, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, perch, rock-fish, salmon, smelt, whitefish, trout, sturgeon.

VEGETABLES.—Artichokes, beans, carrots, celery garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

POTTED VEAL.—Mold into a loaf, three and a half pounds raw leg of veal chopped fine, one heaping tablespoonful salt, one tablespoonful black pepper, eight tablespoonfuls pounded butter crackers, three tablespoonfuls cream or milk, piece of butter the size of an egg, two eggs, one grated nutmeg. Put this in a buttered pan with a little water, sprinkle over it bit of butter and more powdered cracker; bake two hours, eat cold.

CRACKERS.—Make a very stiff paste with one pound of flour, the yolk of an egg, some milk and a little salt; beat well and knead until quite smooth; roll very thin, cut out and bake in a very slow oven till very crisp.

EGG BREAD.—Beat well two eggs and to them add one pint milk, sift in one heaping cupful white corn meal and one small cupful of flour, into which one heaping teaspoonful of baking powder has been mixed, add one teaspoonful salt, one heaping teaspoonful sugar, stir well, add another full pint of milk. Put one large tablespoonful of butter and one tablespoonful of lard into a baking pan; let this come to a boil on the fire, pour it into the batter, stir well, pour the batter back into the pan and bake for half an hour or so until done.

SCRAMBLED EGGS WITH BREAD.—Cut a slice or two of bread into dice and put them in a frying pan with some butter; when they are brown beat up a few eggs with a little salt and turn them into the pan and stir all up together.

STORED LOBSTER.—Boil two lobsters and extract the meat from the shells, put the shells into a pot, pour a pint and a half of water over them with a little mace, whole pepper and salt, and let them boil for an hour; strain. Break the meat into pieces and over it pour some thin melted butter, add a teaspoonful of maderia and a squeeze of lemon juice; add this to the gravy, heat thoroughly and serve.

TOMATOES WITH MILK GRAVY.—Scald some fine tomatoes and remove the skins, put them in a dish and sprinkle over them some pepper, salt and bits of butter, let them cook on top of the stove for fifteen or twenty minutes, take them off and turn them, dredge with flour, add some more butter and milk enough to make a gravy also a slight pinch of soda, set them back on the stove and let scald for ten minutes.

TEA CAKE.—One cupful of sugar, half a cupful of melted butter, one and a quarter cupfuls milk, two teaspoonfuls baking powder, flour to make a stiff batter; bake for twenty minutes in a hot oven.

PEANUTS.

THE OILY GUBER PATRIOTICALLY, POETICALLY AND ECONOMICALLY CONSIDERED.

Since the patriots who are endeavoring to establish a national flower have been unable to agree in their selection, why not compromise the matter and select a nut for our national emblem. There could be no question as to the peanut having the precedence in the matter of choice. Certainly no other nut approaches its popularity, and there is no danger that it will be supplanted in the affections of Americans by any of the new-fangled nuts with high-sounding names that arrive from foreign shores. What the peanut lacks in historical associations it can make up in intrinsic value. The youth of our great country cannot be fed on the sentiment that hangs around shamrocks, roses, lilies or pansy blossoms. They must have bone and muscle building and brain-making food to inspire their patriotism. These are a few of the many good qualities enclosed in the peanut shell. Who does not look back with pleasure on those halcyon days of boyhood when peanuts were associated with such happy events as circuses, county fairs and holidays? The boy who could not rake up enough money to buy a bag of peanuts after securing his admission was very poor indeed. It was the peanut that helped him to digest the show. It was the peanut he was munching while the band played "America" and "Star Spangled Banner," and the peanut will be a conspicuous item with him when the band plays "Hail Columbia" at the opening of the World's Exposition at Chicago. The peanut needs no introduction, but a few words in regard to its production and sale may enlighten some of those people who regard it as an item of minor importance in the commercial world. They do not know that the crop in the United States this year will be worth $3,000,000. Virginia alone will throw upon the market at least 2,000,000 bushels; Tennessee, 200,000; North Carolina, 100,000; South Carolina, 100,000, and Alabama as much as both the Carolinas combined. And yet the peanut industry is in its youth, with great promise to become one of the greatest sources of revenue in the South. Within the last ten years the demand for peanuts has increased wonderfully, both in this country and in Europe. Like all other staples it occasionally gets into the hands of speculators, and the market is manipulated for all it is worth. Consumers, however, do not suffer to any great extent. The Italian on the corner probably reduces the size of his five cent bags or puts in a few more old nuts, but then five cents always buys a sufficient quantity for a man with an ordinary appetite. Since many prominent physicians have recommended peanuts for dyspepsia there has been a decided improvement in the demand at the corner stands. The Dago now prides himself on having regular customers, among whom are solid merchants, lawyers and ministers, who a few years ago would have been ashamed to be seen cracking shells and munching kernels. We are indebted to Africa for the peanut. They grow there in abundance, but we no longer have reason to import them, for the sons of Ham in the Seth are supplying the markets just now. The farms are small but numerous. The nuts are planted in hills, about a foot apart, in rows, and are harvested by plowing and turning over with long handle forks. This shakes off the dirt, when the vines are gathered and shocked about a pole, where they are left to dry, the vines being so placed as to protect the nuts from the rain. The shocks, after they have been built up, are left standing for several weeks until the nuts are quite dried and cured. They are then stripped from the vines by hand, packed in bags and shipped to the commission merchant, who handles them for the farmer. The crops of the last few years have been purchased by a few of the large operators, who managed the market to suit themselves. The nuts that come from the farm must go through an interesting process before they are offered to consumers. They are first placed in immense cylinders, in which they are revolved until each nut is clean and polished. After this process the nuts are fanned and dropped on a table with an endless belt, made of slats hinged together, which revolves very slowly. On each side of the table is a row of girls whose duties are to grade them. They keep both hands flying over the passing belt, and present a lively and interesting sight as they separate the good from the bad ones, and the choice from the indifferent. The inferior nuts are picked over again and branded. It is much of the last grade that is found for sale on the streets. The better grades are usually purchased by grocers and confectioners after they have been carefully roasted. So the peanut is not a thing to be sneered at after all. It has a place in commerce, and deserves recognition.—*Chicago Grocer.*

SOCIAL CO-OPERATION.

THE MANY TRADES BENEFITED BY THE ERECTION OF A BUILDING.

Few people ever stop to think how many trades are benefited when one building is erected. Of course, the more expensive and important the structure, the more trades are embraced in the operation. Take, for instance, a first-class dwelling house of semi-fireproof construction, with all modern improvements, and let us consider how many different materials enter into it, thus calling upon the various "building trades" for their respective contributions and services. Beginning with the materials used in the mere construction of the house, we have stone, brick, mortar, lumber, iron, nails, screws, building paper, mineral wool, etc., etc. Each of these materials has required a longer or shorter, and, in many cases, a difficult and toilsome process, to prepare them for use. When the outer shell of the house is erected, then comes both the exterior and interior finish. The exterior finish requires paint or stains, as the case may be, outside blinds, with their locks and hinges, outer doors with their knobs, escutcheons, locks and hinges, tin or galvanized iron gutters and spouts, shingles, tiles, slate or tin for the roof, etc. The interior finish calls for stain, paint or hardwood finish, according to the specifications; fire-place furniture and tiles for the hearth, mantles, mirrors; glass for windows and doors, from plain American to French plate and stained glass, of the most approved manufacture; screens, gas piping, gas fixtures and furniture; bath-tubs, with the necessary pipes and fixtures of brass, copper or nickel; closets, with their appurtenances; stationary wash-stands in bath-room, with appropriate fixtures; stationary wash-tubs, with appliances; slop hoppers and sinks, with traps, pipes, etc. Furnaces and the necessary registers, or radiators; doors, both single, dwarf, and sliding or double doors, with hinges, knobs, locks, and different kinds of fittings and furniture for pantries and store-rooms; wardrobe hooks for clothes closets, electric bells, speaking tubes, elevators; and for decoration, wall papers of all kinds, lincrusta, gold, copper and bronze paint; various kinds of plaster ornamentation, picture mouldings, etc.; in fact, there are so many items which enter into the construction and completion of a modern house that it is almost impossible to remember them all at one time. Each of the items mentioned has in nearly every case its special manufacturer, and of each branch not one only, but many manufacturers. It will readily be seen, then, that there are fewer kinds of business of more importance, or more wide-reaching influence in the world, than that of architecture and building. In its numerous ramifications thousands of men and many women and boys are employed annually. It takes an immense number of people to build and complete one house. The architect, builder and the various craftsmen employed in the actual work of building and finishing the structure are but a small minority of the people whose labor and skill have been exercised before the house could be erected and completed. When we add to this the furnishing of the house, which includes so

many more items and expenses than those already enumerated as belonging to its construction, we get some faint idea of the great variety of business represented in the building and furnishing of one modern dwelling-house.—*Architectural Era.*

A GREAT CYCLOPEDIA.

The last volume issued of Alden's Manifold Cyclopedia is fully up to the high standard of the preceding volumes, and readers will be pleased to learn of the rapid progress the work is now making; strong financial allies have recently been secured in the publishing department, two large printing offices are now at work upon it, and the publication is to be hastened to completion with all speed that abundant resource and energy can give it. People have wondered how a work of such superior merit and magnitude, and so handsomely and thoroughly well got up—a rival of the Britannica, Johnson, Appleton, and the rest—could be published at all, at prices so remarkably low, and searchers after knowledge, as well as the publishers, are to be congratulated upon the new promise of success. A 40-volume cyclopedia, including an unabridged dictionary of language, large type, several thousand illustrations—all for $30.00, and even that in such easy installments as one pleases to ask, almost, is a great thing for the public!

BUSINESS NOTES.

HORSFORD'S ACID PHOSPHATE

makes an invigorating drink with water and sugar only. Delicious. Dr. H. T. Turner, Kasson, Minn., says: "I have found it very beneficial in nervous debility, from any cause, and for indigestion."

THE MARCHAL & SMITH PIANO CO.

describe their No. 9 Upright as follows: Fancy case, rosewood finish, triple reneered, sunken panels fancy frets, extra carved legs or trusses, swing panel music desk, full iron frames; three strings same as Grand, improved patent action. 7⅓ octaves, 56 inches high, 60 inches long. Cabinet Grand, price $1,000. Guaranteed for six years. In the finish they have allowed themselves wide latitude in artistic designs for ornamenting this piano. The lock board, the panels, corners, frets and trusses, each in turn have especial attention. The effects are beautiful, and make this an elegant, rich, and costly piano. They will box and ship this piano on board cars or boat in New York, with elegant embroidered cover, handsome stool, and best instruction book, and send it for fifteen days' trial in your own home before you buy, for $400. The regular retail price is $1,000; discounts to dealers, 50 per cent., $500; discount for cash, 10 per cent., $100=$600. Their price to all, $400.

THE NEW PHOTOGRAPHY.

Photography is certainly a most interesting and delightful study, and the results obtained by means of the improved system of film photography are so beautiful, and the apparatus employed so simple, it is no wonder thousands of our most cultured people become enthusiastic amateurs. The most ingenious, and it seems by far the most popular camera in use among experts and amateurs alike, is the Kodak, a little instrument measuring but 3½x3½x6½ inches, and weighing only 32 ounces. It is a complete photographic outfit, with lens, instantaneous shutter and material for making one hundred negatives, and so compact and neat in appearance that any lady can carry it without making herself in the least conspicuous. The Eastman Company, of Rochester, N. Y., are the makers, to whose advertisement in another column we call attention.

COLGATE'S SHAVING SOAP.

Colgate & Co. are publishing some unsolicited testimonials to the excellence of their shaving sticks, which only corroborate the general opinion that this old firm makes everything they put their name on of the best materials and the best that can be made. They read: "It makes a dull razor sharp." "Your sample gives entire satisfaction." "Demulcent shaving soap is *par excellence.*" "I can cordially endorse all you say of your Demulcent shaving soap. Without exception it is the best shaving soap I ever used in more than thirty years' experience with many kinds."

A HANDY ARTICLE.

The Boston Tablet Company's kitchen tablet is a neat and useful daily reminder of everything wanted in a household. See their advertisement in another column.

WINE CARS.—Wine is now transported in Europe in tank cars, like petroleum in the United States. One recently carried 11,000 litres from Italy to Berlin, and such transport is looked upon as successful.

ILLUSTRATING ROYALTY.—There was considerable curiosity at the last drawing room held by the Queen at the appearance of an individual in a perfectly plain dress suit, who was personally conducted by a high official of the Queen's household. He was supposed to be a member of the American embassy until he pulled out a pad and began to take sketches for an illustrated paper.

INJUDICIOUS SYMPATHY.—A physician, illustrating the evil custom of talking to an invalid about his pains, says that once he requested a mother to mark a stroke upon a paper each time that she asked a sick daughter how she was. The next day, to her astonishment, she made 109 strokes. A three months' visit away from home was prescribed.

Photographing Colors.—An English photographer claims to have obtained a photograph in which the natural colors were reproduced when the exposure was made, by accident, just at the moment when there came a blinding flash of lightning. He says that a friend of his once got a colored plate under similar circumstances, and believes that electricity has to do with photographing colors.

Coffee Antiseptic.—Dr. Luderitz has recently made a number of observations on the destructive power of coffee upon various microbes. He found that the organisms all died in a longer or shorter period—*e. g.*, in one series of experiments anthrax bacilli were destroyed in three hours, anthrax spores in four weeks, cholera bacilli in four hours, and the streptococcus of erysipelas in one day. It was, however, remarkable that good coffee and bad coffee produced precisely similar effects. He believes that, as previous observers have suggested, the antiseptic effect of coffee does not depend on the caffeine it contains, but on the empyreumatic oils developed by roasting.—*Lancet.*

Hot.—According to Tyndall, the heat which the earth receives from the sun in a year is sufficient to melt a layer of ice 100 feet thick covering the whole earth. But the total heat emittedby the sun is 2,300,000,000 times greater. This would melt ice surrounding the earth at the rate of 2,400 feet in depth in one hour, or boil in the same time 700,000,000,000 cubic miles of ice-cold water, or 800,000,000 while a person takes a single breath. This is as much heat as would be generated by the combustion per hour of a layer of coal 100 feet thick entirely surrounding the sun.

Utah Gas.—"We have enough gas to burn up the world," said Harvey Hardy, of the Midland Investment Company. "In drilling for water we struck it at from 150 feet to 200 feet from the surface, and the wells roar like an engine blowing off steam. The driller, not knowing much about natural gas, struck a match, when it shot up 35 feet and made a flame as big as this building, nearly scaring the life out of the poor fellow. An expert familiar with the gas fields of Pennsylvania on seeing it pronounced it the right thing, and to exist in sufficient abundance to pipe for fuel."—*Salt Lake City Herald.*

Growing Less.—The returns of the pensioned veterans who fought under the great Napoleon, who now receive $50 a year, put their number at 112 instead of 180, as in 1888.

Luminous Fountains.—For several months past the Grand Hotel at Paris has transformed its fountain in the courtyard, where celebrities of all nations are wont to congregate, into a luminous fountain, flashing at night with all sorts of varied colors. A rich Parisian, M. Gastou Menier, has fitted up one of these fountains on his dining table, the works of which are smothered in a huge bouquet, a tasteful and novel addition to the enjoyment of a dinner.

French Toys.—French toys have been rapidly making their way in the world since 1867. In that year only £240,000 worth of them was sent abroad; while last year the total was £2,800,000. England, the best customer, takes a seventh of the whole, and then follow in order Spain, the Argentine Republic, Belgium, the United States, Italy, Germany, Switzerland, Uruguay, New Granada, Turkey and Russia.

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CONTENTS.

AMERICAN WINE.

Reviewing the statistics of native production and importation of wine, published in the AMERICAN ANALYST about two months ago, the San Francisco *Country Merchant* expresses the hope that the projected tariff will exert a beneficial effect upon the California wine industry. Our contemporary says: "There is no question that Eastern consumers of wine annually pay a large sum of money for bogus French or German wines. To prove this, a reliable authority gives the following figures, which conclusively establish the claims so often made by California wine manufacturers that their product is being constantly sold under foreign brands: In 1840, 4,748,362 gallons of wine were imported into America. In 1888 there were 4,654,545 gallons. Yet the population in 1888 was more than three times as great as it was in 1840. For five years previous to 1874 the average number of gallons of wine imported annually was 9,700,000. That year, 1874, native American wine took a great jump upward. The amount was nearly 11,000,000 gallons. Before that it had been no more than 3,000,000 gallons a year. The native wine product in 1888 was over 31,500,000 gallons. In this line the efforts of local wine producers to create a standard of purity for their product is deserving of attention. Government chemists and analysts have taken hold of the subject, and it is likely that the investigations of the eminent professors connected with this department, in co-operation with those of agricultural colleges, will accomplish the desired purpose—a standard which will offset the bogus wine makers of Europe and the East. California is pre-eminently the wine-producing section of the country, and with the attention to this industry which its importance warrants, it is destined to become a source of great wealth to the State. The depression of the past year or so in the wine trade seems to have disappeared, and in its stead a much more healthy tone is noticeable, and confidence is on all sides expressed as to the future.

THE ONE INEVITABLE MICROBE.

A "French medical journal," the name of which is unfortunately omitted, is quoted by the *Sanitary Era* as having announced that Dr. Malinconico, an Italian physician, "has made a greater discovery than the famous elixir of youth of Brown-Sequard. The journals announce, very seriously, that Dr. Malinconico is about to discover the microbe of old age. This microbe is transmitted, according to the Italian savant, by inheritance, invades with age the entire human organism, ravages and destroys it, producing old age and finally death. Dr. Malinconico hopes that he will be able to discover the means to combat, and finally to destroy, this terrible microbe, which will prevent men growing old." This microbe has characteristics peculiarly its own. They may be communicable, but they seem born in the system, and, while a person may escape all other kinds of germs, all become infected with the new one. The doctor may be convinced that he has discovered the germ that brings on old age and decay, but we prefer to defer our opinion as to his power to neutralize its pernicious action for, say a couple of centuries, by which time we shall have had a fair opportunity to give the "discovery" a reasonable practical test.

PAINT ADULTERATIONS.

The propriety of enacting stringent laws to compel manufacturers and dealers to label the goods they handle, so as to show the latter's character and composition, is rapidly gaining the acceptance of the whole honest-minded portion of the community. We learned recently that an agitation against the prevailing practice of paint and oil adulteration has led to a bill being framed to regulate such adulteration by making it a misdemeanor to falsely label any pigment or linseed oil. The principle upon which the bill is framed is simply that purchasers shall not be induced to purchase paints or linseed oil by deception. There is no attempt made to prevent, nor is it desired to prevent, the sale of cheap material to those who desire to use it. But if, for instance, a manufacturer marks a package "chrome yellow," either with or without such adjectives as "best," "pure," "superfine," etc., such package must contain pure chrome yellow, or both the manufacturer and the seller be subject to heavy penalties. If, however, the package contains, say, only seventy-five per cent of pure color, and a statement to that effect is placed on the label, the sale of such color will not be unlawful. The bill will be presented to Congress as soon as practicable, and it will be accompanied by the petition of master painters and other consumers of paint in favor of its becoming a law forthwith.

CONVERTED AT LAST.

"The immense annual increase in the shipments of Western dressed beef for consumption in the Eastern and Middle States indicates the increasing power of the 'Big Four.' In a few years the only live stock shipped east from Chicago will be for export."

The above paragraph is quoted from the *Butchers' Advocate* of April 2d. It does not, it is true, convey much information to the general public, for the steadily expanding business of the dressed beef industry has been repeatedly described and discussed by both the American and the European press. But our esteemed contemporary has hitherto displayed such a degree of helpless and apparently hopeless ignorance on a subject that everybody else in the world has thoroughly understood as to excite suspicion occasionally respecting the disinterestedness of its expressions of opinion. It seems now, however, to have had its eyes opened, and we congratulate it for having even at this late day recognized the error of its former ways. For even if the apparent reform is attributable to the fund being exhausted, and the refusal of the local trade to renew the subsidy, it is none the less a reform, as it is likewise an unexpected gratification, to see our contemporary veering in the direction of truth and honest statement of fact.

VITICULTURE AND THE CENSUS.

We observe that in the compilation of the eleventh census, the Government will pay great attention to the viticultural industry of the United States, and the reports when issued will contain much and varied information. The blank forms to be sent to the producers call for all kinds of information on vine growing and wine making in every section of the United States. The statistics will include a directory of grape growers and wine makers; the capacity and output of wineries during the present decade; and the various expenses thereof; the quantity of brandy distilled and Internal Revenue tax paid; market value of wine and grapes, total value of output, value of buildings and machinery; profit on investment; also quantity and value of champagne produced. In regard to vineyardists the reports

will contain the area, value and cost of products, labor and capital invested, and profit on investment. Special inquiries of a similar nature will likewise be made concerning the production of brandy, its cost and value, the exports of wine and brandy, types of wine produced and varieties of grapes grown; matters pertaining to soils, irrigation, meteorology, fertilizers, the effect of disease and insects on vines, the percentage of loss thereby, and divers other information of more or less importance.

A PREMATURE PUBLICATION.

In our issue of April 17, we published in full the report on food adulterations of the New Jersey State Dairy Commission. The appearance of this report in the columns of the AMERICAN ANALYST was in advance of its regular official publication by the New Jersey authorities, owing to the fact that one of the persons employed to prepare it presented it in advance to Mr. F. B. Thurber for publication in his special weekly trade organ. Having thus reached the light the AMERICAN ANALYST, and we believe one other newspaper, availed itself of the opportunity to place it fairly before the attention of the public. We are led to make this explanation in order to avert any possible misconstruction as to the manner in which we secured the report in question in advance of its proper official promulgation, its original premature appearance above mentioned having given rise to some harsh comment on the part of some of our contemporaries. Thus the *Merchants' Review* of this city in its issue of April 11 says: "Regarding the value of this report to the people of New Jersey, it is, perhaps, sufficient to say that one of the chemists engaged by the Commissioner to analyze suspected articles is a protégé of a member of a wholesale grocery firm of this city and is employed by the firm as an analytical chemist. This firm is engaged in the manufacture and preparation as well as the sale of food products, and the fact that their hired chemist has been employed to analyze the goods of rival manufacturers and dealers is a suspicious circumstance. Such a proceeding may suit New Jersey citizens, but in this State it would result, we believe, in an urgent demand for the removal of a State official who would lend himself to a scheme of this nature. Two of the members of this same firm, according to the sworn testimony of the editor of the local trade journal which received the advance report of the Commissioner, are the principal stockholders of said paper; it is, therefore, easily seen why it was favored at the expense of all its contemporaries."

TRIUMPHS OF CHEMISTRY.

A BRIEF SUMMARY OF THE MANIFOLD USES OF COAL TAR.

From coal tar enough money has been won during the past twenty years to pay our national debt thrice over. As to the number of coal tar derivatives with a market value, they count by the hundred, among them being some which have revolutionized whole branches of manufacture. For surgery the carbolates, such as carbolic acid, etc., are the leading tar products. As a disinfectant and "decay killer" this chemical has achieved wonders, and has also made possible hundreds of thousands of surgical operations and subsequent cures. This substance is gained by the distillation of coal tar, and forms, in a chemically pure state, a colorless, solid material, which on exposure to the air at once dissolves and acquires a reddish or brownish hue in the operation. From carbolic acid again are derived several important dyestuffs, such as picrine, salicylates and resorcine, the latter two of which are much used for the purpose of preserving human food. Picrine was formerly gained from the expensive indigo and from nitric acid, but now it is simply obtained by allowing this acid to react on carbolic acid, thus cheapening the process and product immensely. Picrine is one of the most powerfully active dyes in existence, especially when brought in contact with silk tissue. One part of this chemical is sufficient to dye 7,000 parts of silk. It acts similarly on wood fibre, but not at all on a vegetable tissue. Among the compounds recently evolved through chemical combination out of picrine the French explosive, melinite, of which so much was expected up to recently by French military authorities during the next war with Germany, may be cited. The German chemists have since discovered that melinite is nothing more or less than a mixture of collodion and picrine. Then there is saccharine about which there is much yet to be learned, also the aniline dye stuffs. Benzol, a fluid and easily evaporating product of the destillation of coal tar, is the basis for aniline, as it is the foundation for a long string of compounds which, because of their penetrating and aromatic odors, may be classed with our most valued perfumes. Most of the contents of prettily labelled cut-glass bottles with high-flown French names to send them along, in reality comes from the chemical laboratory, where coal tar was used as the main ingredient for what is finally turned out as jockey club or something else.

KEELY REDIVIVUS.

AN EXHIBITION OF THE VIBRATORY FORCE OF SYMPATHETIC CHORDS.

Prof. Joseph Leidy, of the University of Pennsylvania, the President of Philadelphia's famous Academy of Natural Sciences; Mr. James M. Willcox, author of "Experimental Philosophy;" a well-known woman of the world who has befriended Keely, and a representative of *The World* sat in the workshop of Keely, the alleged discoverer of a new force, and saw queer things Saturday. He said he would try to show three experiments, from which he would ask Dr. Leidy to declare whether he Keely was a fraud or whether he had discovered a new and wonderful force. Mr. Willcox was present, it was stated, as a practical phyisicist whose writings and researches had led him to deny the possibility of any such discovery as Keely claimed to have made. The lady referred to, who is a very wealthy and benevolent woman, as well known in London as in the United States, said the experiments were made in what it was hoped would be the interests of science, and not to boom any speculative company's shares; neither she nor Mr. Keely cared a fig for the price of any stock. She was Mrs. Clara Bloomfield-Moore. The room was the upper one in a two-story brick workshop in the northern part of the city of Philadelphia. It was about fourteen feet square, uncarpeted. Dr. Leidy, one of the most distinguished scientific men in the world and a member of nearly two score learned societies in this country and Europe, sat about nine feet from the machine by which Mr. Keely, a big, tall, awkward-looking man, with dark hair and eyes and beard and clumsy-looking hands, took his stand. Mr. Willcox and the other two present sat nearer. There was a bright sunlight in the room and every part of it was distinctly visible to everybody. "What is the name of that machine you are standing by?" somebody asked Keely. "It is," he replied, "a sympathetic transmitter. It is a negative transmitter." "Is the force you use generated in it?" asked Dr. Leidy. "It is," was the answer. The thing referred to was a cupboard about thirty inches high on which stood a cylinder of what looked like bronze fitted with a concentric series of upright tubes one-half inch in diameter, also of the same metal, surrounded at its base with a series of graduated horizontal rods, solid and evidently of some resonantal metal, and capped by a bell-shaped metal cup, in which appeared to be several tuning forks about four inches long, set parallel to each other. The cupboard door was open. Inside it appeared a curious-looking harp and a glass bell, to which Keely put his ear every now and then to see whether he had hit the proper "sympathetic chord"—he said—on the resonant rods and on the harp-like instrument. "Now he's going to begin," said somebody. Keely took a common twine string out of his pocket, wound it around a little brass spindle in front of the cylinder on top of the cupboard, jerked the loose end as a boy would spin a top, and set the spindle whirring very rapidly. He then attached a metallic wire, which he said was made of platinum and silver, and which was about as big as a small knitting-needle to a small aperture in the cylinder. The wire fitted as if it belonged there. The wire was about three feet long. He attached the other end of the wire to what looked like a five-pound weight of copper on a table near by, and on this he put a little metal disc, in which he laid a magnetic needle. All this time the spindle he had spun with his twine string was revolving at a prodigious speed. He sat down in a big chair by the cupboard and began striking the strings of the harp and tentatively seeking with the other hand a responsive chord among the resonant rods on top of the cupboard. When what he said was "B flat" was touched on both rod and harp string the magnetic needle gave a shiver distinctly visible to everybody and began slowly to revolve from left to right. In a half minute it was going so fast as to be almost invisible. Keely did not go nearer to it, but sat by the cupboard with his hands in his pockets. The spindle revolved all the while and the echoes of the note came from the cupboard. "The force, which is a vibratory one," said Keely, "has been transmitted along the wire to the metal disc on which the magnetic needle stands. The disc is solid, as you see, but the force is powerful enough, as now generated, to keep that needle revolving at the rate of 120 revolutions a second for fourteen weeks." "Has your alleged force anything to do with magnetism?" asked some one. "As I understand it," Mr. Willcox remarked, "you claim it to be an interruption of the magnetic currents of the earth?" Said Keely: "There is an unceasing, all pervading dual flow of this new force, negative and positive." Mr. Willcox and Dr. Leidy then examined the platinum wire, the metal disc on which the magnetic needle rested, the cupboard, the base of the cupboard and the table on which the disc and needle rested. When asked if there was, in his opinion, any possibility that the force which made the needle revolve was electricity, compressed air or steam, Dr. Leidy looked thoughtful and said he could not see the possibility of any of those forces producing the result attained. "What you have seen was shown you in order to illustrate the ease with which this force can be made to do work," said Keely. "Of course the work just done was trifling, but I hope now to show you what will look very different." He pointed out then two glass jars, such as chemists use, on a table near by. The jars were of the same size, about forty inches high and ten inches in diameter. They were filled with what was said to be and certainly smelled and tasted like Schuylkill water. In the bottom of one jar lay a copper globe, cut in half to show—Keely said—just what it was; and filled in each hollow half, with iron nails. In the other jar were three brass balls of different sizes. The copper globe and nails were weighed by Dr. Leidy, and found to kick the beam at five pounds and six ounces. The brass balls or eggs—they were egg-shaped—weighed less. Everybody sat down after the weighing and Keely fastened another "platinum silver wire" to the cylinder on the cupboard and, detaching the one already in use from the magnetic needle disc, was about to fasten the loose ends of each to the metal discs that covered the tops of the jars when some one asked if the wires were "hollow." The suggestion was followed by a smile from Keely, who at once cut off the end of one of them and handed it around. "Prof. Roland, of Baltimore, declared that this was a fraud because the wires were hollow," said the woman of the world; "but Mr. Keely asked him how he could explain what Keely did even on the hypothesis that the wires were hollow, and he didn't answer. Then Kelly got mad and wouldn't let him cut a wire, as he wanted to do." Dr. Leidy followed everything closely. "What name do you say, Mr. Keely, you give that instrument to which you attach your wires for these experiments?" "Sympathetic negative transmitter," an-

swered Keely. Then he fastened the loose ends of both wires into the metal caps of the cylinders. Again he spun the spindle on his cupboard with the twine string he had used before. Again with his gnarled fingers—the joints of the first two fingers of his right hand are as big as walnuts—he sounded the "harp" in the cupboard and the resonant bars on top of it. "What are you doing now?" asked Dr. Leidy. "I am trying," said Keely, "to get the mass chord of that copper sphere full of nails. Every aggregation of molecules or of matter, I claim, or, in other words, every mass of matter has a sympathetic chord, through the medium of which I can operate my vibratory force." The chord was not found for some minutes. Again the spindle was spun by the help of the twine and its whizz was distinct in the silence of the room. The search for the mass-chord continued on the "harp" and the resonant rods. A deep clear note resounded from both at the same time and at the instant it broke on the ear the heavy copper globe quivered as it lay at the bottom of the water, rolled over and reluctantly, as it were, abandoning the ties by which gravity held it to the bottom of the jar, floated, at first slowly and then more swiftly and steadily to the top of the jar, against which it impinged with an audible concussion! "Why there is the force of gravity as plainly overcome, and, indeed, annihilated, as it is possible for a human being to imagine," exclaimed the woman of the world. Dr. Leidy was asked this question: "Doctor, is it true that this unknown force, or what is here manifested as such, has actually before your eyes overcome the force of gravity, with which we are all familiar?" And the answer, slowly, deliberately, was: "I see no escape from that conclusion!" Attention was then attracted to the little magnetic needle which had been put in position on a portion of the cylinder on top of the cupboard. It was whirling so fast that only a fleeting shadow of its coming and going was perceptible. "Measuring the force," said Keely, "by vibrations, 18,000 of them to a second, are necessary to raise that weight through the water. The current that raises the weight is, of course, a positive current. You see the copper globe remains 'suspended' on the surface of the water. I turn on the negative current" (here he struck a low minor chord) "and the globe trembles and begins to descend." It was as he said. The minor chord brought the copper globe downward to the centre of the jar, where a quick return to the major held the globe hanging motionless, half-way between the bottom and the top. In a moment more it began to ascend and the top of the jar was again reached. There it remained, "the quality of the vibrations," Mr. Keely said, "being unchanged." Turning to the other jar, Mr. Keely tried again to strike the chord desired to carry his positive current of force to raise the three brass balls at the bottom of the water. "There are three distinct masses to be operated on," said he, "and the mass-chords for them all are different each from the other." Finally a note was struck which sent a sort of a shiver through one of the balls, the smallest. It slowly mounted through the water. Remaining awhile at the top, the negative current, Mr. Keely said, was turned on and it descended. A different chord was struck and the same ball and one of the others together climbed up to the surface again. There they remained, while an effort was made to raise the biggest of the three. After some difficulty that one, too, was forced to the top. A change of action brought them all three as far down as the middle of the jar. There they were stopped. "As I understand it," said Mr. Wilcox, "Mr. Keely claims his force to produce an interference with the magnetic currents of the earth. The earth is enveloped in magnetic currents as an orange is with its rind." Dr. Leidy was asked what he thought of this proposition. He assented to it. "This last," said he, "is a wonderful experiment. It impresses me favorably." The last experiment performed was what was announced as being the propagation and application of "the force" through the atmosphere, from one room to another, without other medium of conveyance than a silk cord. The door into the little back shop, whose existence until then was unsuspected, was now opened, and a silk cord passed from the transmitter to a large bronze globe mounted on an axis horizontally. The other end of the cord was not fastened to the globe but to a slender bar of steel supported on uprights near it. A plate of glass an inch thick was put between the end of the resonant steel bar and the globe. A similar piece of glass was put between the wall and the other end of the bar. Glass was put under the uprights which supported the bar. Glass plates were also put under the uprights which supported the axis of the globe. Keely then took a harmonicon in his hands, and allowing the silk cord from the "transmitter" to pass over the harmonicon in contact with it, began to sound notes on it. When "the sympathetic chord," as he said was struck, "the vibratory force," he declared was conveyed along the silk cord. The bronze globe, which was about 14 inches in diameter, began to revolve upon its axis. The faster Keely played the faster the globe whirled. "Some day," said Dr. Leidy, "I suppose a young lady will be able to play on the piano and set her father's mill to grinding. I see no possible source of deception. This demonstration is wonderful. There is no explanation of the effect thus produced, except by a vibratory force such as Keely assigns as the cause." Dr. Leidy spoke with an air of conviction. "Would you care to be quoted to that effect?" he was asked. "I have no objection," said he. He walked over and examined the apparatus of the last demonstration. The cord was inspected and chopped into pieces, some of which were given to each of those present. The harmonicon was looked into. It had a weather-beaten look. The top was removed by the aid of a monkey-wrench from one of the tall cylinders in the workshop proper, and the nails with which the copper globe had been floated up and down in the water were taken out and handed around. "I expect to solve the problem of aerial navigation, said Keely. "For I can already move a weight up and down in an atmosphere or even in vacuo." Nobody offered any remark on this remarkable declaration. "What is the force with which I expect to do this? The same sympathetic attractive force which holds the planets together. The force is dual. The sympathetic negative dissociates molecules just as the sympathetic positive associates them. I believe electricity to be a substance, not a force." This man, who has broken the joints of his fingers, broken three of his ribs, paralyzed his left side and temporarily lost the sight of one eye in his search for the "principles of the new force," said the experiments were over. As Dr. Leidy turned away he said with authority and with the full understanding that he was speaking for publication: "You may announce to the world on my authority that John E. W. Keely has discovered a new and wonderful force."—*New York World, April 7.*

AN EDUCATED SEAL.

A FISH STORY IMPORTED DIRECT FROM FRANCE.

The *Republique Francaise* gives a long account of the life and adventures of a singularly learned seal that has just made his debut in Paris at the Fernando Circus. The seal, it appears, came from Russia when he was quite young, having been sent to a fishmonger in Orleans. Instead of killing him and selling him in pieces to his customers the fishmonger took compassion on the the queer little animal and made a household pet of him. At the end of six years Phopho, as the seal is called, grew to be a big, fat fellow. He always came when he was called, and cheerfully gave his paw, or rather his flipper, to everybody that he was introduced to. In addition to this evidence of good breeding, he displayed remarkable talents, and skillfully performed feats that would make an imperfectly educated terrier ashamed of himself. When the fishmonger decided to leave Orleans for Paris he, of course, brought his pet along with him, placing him in a large water tank and sending him as freight with the inscription "live fish." When he arrived in Paris he had to consider the difficulties of finding a lodging for himself and the strange member of his family. Seals have often been exhibited in large aquariums, but to get accommodations of that description for Phopho was something altogether beyond the financial reach of the fishmonger. So he hired apartments in a hotel in Montmartre, including a room for Phopho, adjoining the one in which he lived with his wife. Phopho's bed chamber is furnished with a water tank, and that is all. In this way the happy family are able to continue the pleasant mode of life which was commenced five or six years previous in Orleans. On fine days the seal tramps along at a lively flip-flap gait a portion of the distance between his boarding house and the Fernando Circus, where is exhibited. On wet days, strange enough, he insists on being taken in a carriage. He has a horror of rain. He is already quite a pet with the gamins of the neighborhood, who were at first greatly surprised to find that he preferred fish to candy. At the circus he rides a horse and a velocipede, and also performs upon a trapeze made specially for himself. Montmartre is justly proud of this wonderful seal, and everybody wishes him a long life and prosperity.

COMPARATIVE FIGURES.—Sound travels about 1,093 feet per second; a rifle ball flies 1,460 feet in the same time; light moves 192,000 miles per second; while electricity makes 288,000 miles per second.

A NOVEL SCREW.—Screws of all kinds are still a theme for study, especially in the wood-working line. Some one has proposed to make them hollow and, after they have been driven into place, to expand them a trifle with a wire nail to get more of a bind in the wood.

MOTTLED TIN CANS.—The mottled appearance of the inside of tinned cans, used for preserving vegetables, is due, according to an investigation of Beckurts, to the formation of compounds with the tin, which in some instances are sulphur compounds, derived from the action of the sulphur contained in many vegetables.

ETERNAL LITERATURE.—The most remarkable material for book-making is proposed by Professor Castagnetta and partially carried out by Professor Burkham, of Brunswick. His idea was to make a book indestructible by printing in gold or silver letters upon thin leaves of asbestos, the binding to be of a thicker sheet of asbestos. Neither time nor fire could have any effect upon a volume of this kind, and it might well merit the title of "the book of eternity."

AFRICAN RUBBER.—Mr. Henry M. Stanley, in an interview with a New York *Herald* correspondent, said that the Aruwimi forest, which belongs to the Congo Free State, was enormously richer in everything, especially in rubber trees, than the Amazon forests. This section of Africa, he declared, would be the rubber reservoir of the world. This is certainly encouraging for American wire manufacturers who use rubber in their insulation. Such a statement from so reliable an authority ought to have a salutary effect on the market price of rubber.

WHAT ELECTRIC LIGHTS COST.—The new bids of the electric lighting companies for lighting the city of New York are about 20 per cent. higher than last year. This is accounted for by the fact that subway service is very costly. The United States Company wants from 39 to 42 cents a night for 314 lamps. The Brush Company bid the same for 337 lamps. The bid of the Mount Morris Company for 175 lamps ran from 39 to 42 cents; the Harlem Company, 185 lamps, 39 and 50 cents, according to location, and the East River Company, 226 lamps, 42½ cents.

NATIONAL PUBLICATIONS.—The Congressional Printing Committee propose to print 10,000 copies of a compilation of the inaugural addresses of Presidents of the United States from George Washington to Benjamin Harrison, inclusive, for the first century of Presidential inaugurations, with authenticated incidents connected therewith, biographical sketches of the Presidents from official sources, together with steel-plate portraits of the Presidents and steel-plate illustrations of the Capitol and White House. Also, 10,000 additional copies of the volume known as "The Growth of Industrial Art, with some additions."

NINETEENTH CENTURY SUPERSTITIONS.

WITCH DOCTORS IN THE SOUTH, AND THEIR METHODS.

A correspondent, writing from Goldsboro, N. C., under date of March 21st, says:

In Wayne County, of which this town is the county seat, many of the inhabitants believe in witchcraft as firmly as they ever believed in the doctrine of State's rights, and are as willing to sacrifice their lives on the altar of their superstition as on that of a mistaken patriotism. The Carolinas, Georgia, Alabama and other Southern States abound in so-called "witch doctors," who will cure your ills and kill the witch that is troubling you. Some of these doctors actually believe in the personal existence of witches and in their supernatural power, but many of them are frauds who make a living out of the credulity of their neighbors. The negro race is naturally superstitious, but the poor white "crackers" are also ignorant, and for believing in spooks, spirits, hobgoblins and other unnatural phenomena, they can give the negro cards, spades and aces and then beat him. The cracker is worse than the negro, because he fondly imagines that he is much shrewder, and so he does not use what brains he has, nor does he try to learn anything. He has thousands of signs, omens, cures and beliefs that are a continual source of annoyance to him and perpetually keep him a state of unrest and dread. The simplest incident is one of sinister and occult meaning to him, and he is ever in a tremor lest ill luck and misfortune overtake him. The evil influences manifest themselves in various ways, and each one seems worse than the other. His gun occasionally hangs fire and refuses to "go off" properly, and at times is so badly deranged that it cannot be discharged at all. At other times his favorite coon dog is bewitched by some evil-minded and envious person, and then the woe of the cracker is something painful to witness. If his gun were not bewitched why could he not kill a squirrel with it? And why should his dog refuse to hunt coons when to hunt coons was his business? These are questions that he can answer only by assuming that a witch has been influencing him and his property. He employs a witch doctor, to whom he pours out his tale of woe, and yields up his hard-earned cash. The doctor cares little for the woe, but the cash is grateful and exhilarating. The doctor is sanguine, and declares that he has a method of killing that is strictly original, copyrighted and warranted to be effectual. In one case that I came across, the doctor learned that an old woman, living several miles away, was the suspected party, and he commenced a campaign against her. He told the victim to go to her house some night and stretch a white cotton string around the building and tie the ends together with a "weaver's knot." Then he was to walk around the house seven times each way, recite a given sentence in front of each door while making mysterious marks on it, and the cure would be completed. The directions were followed, and I am happy to say that they proved effectual, as the next hunt resulted in the death of three coons. Another time a small powder was given, which must be swallowed by the witch without her knowing it. The old lady was invited to dinner, the powder placed in her cup of coffee, and the cure was as complete as could be. But the common and old reliable method of killing a witch is as follows: The doctor must catch a glimpse of her and from memory draw her picture. This need not be a good likeness of the witch, but it must bear the same general form, and it is still better if some of the features are exaggerated. Then this picture must be hung up and shot with a silver bullet. If the bullet hits the picture, it kills the witch, and she can never trouble you again. The silver bullet is usually made by melting a silver coin. This whole ceremony, which is comically absurd, will be performed with an owl-like gravity and breathless interest that leaves no room for doubting that it is regarded as effectual and is a serious and important matter, indeed. There are some advantages in witchcraft, as the true believer in sorcery has a ready excuse to fall back on in an emergency. Should his corn refuse to grow, it is an easy matter to claim that it has been bewitched. This is a simple and satisfying statement, and it is therefore common for the shiftless cracker to insist that it was witches and not weeds that rendered his garden unproductive. About fifteen miles north of here I ran across a young fellow who was a veritable mine of information in regard to witches and attendant subjects. He solemnly assured me that the carrying of an axe, hoe or spade through a residence would cause a death in the family within a year. Should the utensil, by carelessness or accident, be carried into the house, it must be taken out at once by the person who carried it in. He must go out at the same door through which he entered, taking as nearly the same steps as possible and holding the tool in the same position. This precaution would, I presume, enable the family to escape with a hard spell of sickness. On getting up one morning, there were several curls in his hair, making it look as if a rat had been making a nest in his tangled and matted locks. He gravely wagged his head and declared that a witch had been trying to give him a headache. All day he was in a deep study trying to make up his misty mind as to the identity of the witch. The next night, before going to bed, he turned around three times and then got into bed backward, thus befuddling the witch and warding off a second attack. He explained to me that at times he could discourage a weak-minded witch by turning in the road and walking backward for a short distance, or could fool one by affecting a limp that was deceptive. Some few days after this the young man, who seemed to be particularly unfortunate, put his waistcoat on wrong side in front, and wore it that way all day. An inquiry developed the fact that this was a precaution against rheumatism, and was a perfect safeguard. He actually regarded the killing of witches as the most important business of his life. He was always in a state of alarm bordering on terror lest he should fail in his efforts and should ever after be under the sway of some awful witch. For generations the poor whites have believed in witches, and the belief is deep-seated and unconquerable. Murders have sometimes been committed because of this belief. Killing the invisible witch too frequently leads to the killing of the person believed to be guilty of witchcraft, and the murderer feels no compunctions of conscience.

SUGAR.

ITS HISTORY FROM EARLIEST RECORDS TO THE PRESENT TIME.

Heredotus, one of the earliest writers of whose works there is any record, informs us that a tribe in Africa called the Zygantes had, "besides honey of bees, a much greater quantity made by man." It is also stated that Nearchus, the chief Admiral of Alexander the Great, "discovered concerning canes that they make honey without bees." Very ancient races, therefore, were acquainted with the fact that certain canes yield sweet juices, and being ignorant of any methods of purifying these juices, their sugar could not be got to crystallize, and resembled honey in consistency as well as in taste. Megasthenes, however, writes much later concerning "the India stone, sweeter than figs or honey," so that by this time some rude method of crystallizing or solidifying the juice had been discovered. The early Jewish historians make no mention of sugar, the only sweet substance habitually used by the Hebrews being honey; but Isaiah speaks of "sweet cane," and there is a disputed allusion to it in the Song of Solomon. It was not until about the commencement of the Christian era that sugar was spoken of by an appropriate name. "In India and Arabia Felix" writes Dioscorides, "a kind of concrete honey is called *saccharon*." This term is evidently adapted from the Arabic *assokar* or *shuker*, which itself is derived from the Sanscrit *sharkara.* Speaking of names, it is rather odd that the Hebrew word for being intoxicated is *shacar*, a word which is evidently closely connected with the Arabic; it is interesting, too, when we remember the ready conversion of sweet liquids into alcohol. There seems to be little doubt that the origin of the manufacture of sugar must be sought for in India and Arabia. Apart from the evidence of Dioscorides, we are always disposed to trust Pliny, to whom we are indebted for so much information concerning the manners and customs of the ancients. In Holland's translation, Book xii., chap. 8, we read, "As for sugar, there is of it in Arabia, but the best cometh out of India. A kind of honie it is, gathered and candied in certaine canes; white, this is, like gumme (Arabicke) and brittle betweene a man's teeth. The graines hereof, when they are at the biggest, exceed not a filberd nutte, and serve for physicke." Sugar, as known to the ancients, was doubtless far less palatable than it is now. In preparing it the canes and the roots were frequently boiled, so that certain bitter and aromatic principles must needs have been extracted. The quality imparted to the sugar by this process might have determined its use for medicinal purposes. It is certain that sugar was only regarded as a sort of medicine for several centuries, and confirmation of this statement may be found in the fact that it is rarely mentioned except by physicians and learned men, nor with tolerable precision except by the former. The Greeks and Romans used sugar as a medicament almost entirely, and it is occasionally alluded to by the physicians of the Augustan age. During the seventh century the empire of the Saracens was scarcely inferior to that of Rome in the times of her greatest prosperity, and, we may add, rapacity. They conquered Western Asia, overran Northern Africa, and carried their arms into the south of Europe. To these semi-barbaric Saracens Europe was indebted for the manufacture of sugar—a commodity the consumption of which may now almost be taken as a measure of a nation's civilization. There are many who attribute the introduction of sugar to the Crusaders. But sugar has undoubtedly been cultivated in Spain for nearly 1,000 years, and, it has been asked, since the Crusaders were collected from all parts of Europe, how is it that Spain was the only country favored with this valuable commodity? Of course the Crusaders did find sugar in Syria, and they may have assisted in making it better known on their return to Europe. We read in the history of the second Crusade that Richard Cœur-de-Lion captured seven camels laden with sugar, and that his knights found "sweet honied cannes called Zucra." These they gathered and sucked, and were "much pleased with the sweete taste thereof, with which they could scarcely be satisfied." It was long before the mechanical arts were applied to the preparation of sugar, and longer still before any method of clarifying the juice of the cane was discovered. The use of alkalies is believed to be an invention of the Moors who settled in Spain. Sugar appears to have been very little known in England till the fourteenth century. In 1329 the Lord Chamberlain of Scotland speaks of loaves of sugar which were sold at 1 oz. of silver per lb., a price equivalent to about $4 of our money. The manufacture was not carried on in Great Britain at this time, but small supplies were imported from Venice, where sugar refining had already become an important industry. Although old Harrison, the chronicler, speaks of sugar and wine as being a common drink amongst the upper classes during the sixteenth century, it is probable that sugar did not become an article of ordinary consumption until the middle of the seventeenth century. The sugar industry was started in Barbadoes by some English merchants in 1643. It is commonly supposed that the cane was introduced into the Western hemisphere by the Portuguese and other early European settlers, but it is decidedly stated by the first explorers in these regions that the aborigines of Virginia and other parts of America prepared sugar from the maple juice, and also from a native variety of sugar cane. The Spaniards did, however, transplant the cane, which they cultivated in their own country, and to them

must certainly be ascribed the introduction of the sugar industry into Madeira and the Canaries. The history of sugar cultivation is one of successive migrations westwards, due chiefly to the rapid exhaustion of the soil inseparable from the cultivation of the cane with slave labor, and to an ignorant carelessness in the treatment of the land. The opening up of new highways of commerce, the facilities of communication and intercourse amongst nations, the more scientific methods of cultivation and processes of manufacture, and the fresh sources from which sugar can now be derived, have all contributed to the phenomenal development of trade in and consumption of this commodity which has characterized the present century. In 1700 the amount of sugar consumed in Great Britain was 10,000 tons; in 1800 it had risen to 150,000 tons; whilst in 1885 the amount of sugar consumed was 1,100,000 tons. Of course the population of the United Kingdom has more than doubled since the commencement of the century, but this of itself is insufficient to account for the extraordinary increase. It has been said that, sugar being an article of luxury rather than a necessary of life, the extent of its consumption is affected by the condition of the people, as well as by the market value, and that any increase from the first of these causes is a satisfactory indication of prosperity. That being granted, it is very comforting to note that whereas the average consumption in the United Kingdom was 16 lbs. per head in 1844, it is now nearly 70 lbs. per head. The greatest consumers of sugar are the people of Gothic and Teutonic stock; the English and their offshoots above all others. The Australian colonists consume over 70 lbs. per head per annum. Nations differ widely in their ordinary tastes and habits, and especially so in respect to foods; neither wheat, rice, meat, nor potatoes, can command unanimous favor, but sugar is so agreeable and nutritious that it is universally acceptable to both civilized and savage man.

HEALTHY HOMES.

DESCRIPTION OF A SANITARY HOUSE AND ITS FURNISHINGS.

It will stand facing the sun, on a dry soil, in a wide, clean, amply sewered, substantially paved street, over a deep, thoroughly ventilated and lighted cellar. The floor of the cellar will be cemented, the walls and ceiling plastered and thickly whitewashed with lime every year, that the house may not act as a chimney, to draw up into its chambers micro-organisms from the earth. Doors and windows, some of which extend from floor to ceiling, will be as abundant as circumstances permit, and will be adjusted to secure as much as may be through currents of air. The outside walls, if of wood or brick, will be kept thickly painted, not to shut out penetrating air, but for the sake of dryness. All inside walls will be plastered smooth, painted and however unæsthetic, varnished. Mantels will be of marble, slate, iron, or if of wood, plain, and whether natural, painted or stained, will be varnished. Interior wood-work, including floors, will all show plain surfaces, and be likewise treated. Moveable rugs, which can be shaken daily in the open air,—not at doors or out of windows, where dust is blown back into the rooms,—will cover the floors. White linen shades, which will soon show the necessity of washing, will protect the windows. All furniture will be plain, with cane seats, perhaps, but without upholstery. Mattresses will be covered with oiled silk; blankets, sheets and spreads, no comforts or quilts, will constitute the bedding. Of plumbing, there shall be as little as is necessary, and all there is shall be exposed as is the practice now. The inhabited rooms shall be heated only with open fires, the cellar and hall by radiated heat, or, better, by hot air furnace, which shall take its fresh air from above the top of the house, and not from the cellar itself or the surface of the earth, where micro-organism most abound. There will be "house cleaning" twice a year. Put into this house industrious, intelligent and informed men and women,—absolutely essential conditions,—and as much will be done as at present may be done to prevent the dissemination from it of contagious disease, when an inmate brings it home from a septic house, hospital, sleeping-car, school-room, theatre, church, etc.—*Independent.*

THE AGE OF UNREST.

FEVERISH LIFE OF THE AVERAGE NEW YORKER.

A correspondent of the Boston *Transcript* says, respecting the people of this metropolis: "New York seems possessed by a spirit of unrest. Not only every hour, but every minute of one's time, is taken up. The fashionable world is just as busy as the world of business, and, I declare, I think that it is the more exhausting work of the two. But the trouble is, we want to combine the two. The girl who earns her bread by writing society notes strains every nerve to do as does the world that she reports. The broker's clerk who has to be at his desk by nine in the morning dances until within a few hours of the time that he is due there. The broker himself, too old to dance, spends his evenings in hotel corridors, where the money market is open till midnight, and the "ticker" ticks till morning. Young women are not satisfied with one reception of an evening, but they go to a dinner, a theatre, and wind up at a dance. One house in New York does not open its doors for dancing until all the others are closed. Many of the girls who dine and dance six nights out of the seven are interested in other things as well. They belong to church organizations, they belong to reading clubs, they are taking a course of scientific lectures, they attend pianoforte recitals, and they have a round of calls to pay that alone should keep them busy. A man who does not pretend to go so very deeply into the social whirl said to me the other day, as he drew a memorandum from his pocket: "Here is a list of fifty-five calls that I have got to make before the end of the season. I am at my office until six, and am usually busy with my work in the evenings until the end of the week, so that it is continually on my mind to know how I am going to reduce this list. I like my friends, and if they invite me to dine, and there is no good reason why I should not, I accept. That means a dinner call, of course, and so it goes." He is not like one young man whom I heard say: "If I accept their dinner invitations I do enough. They must not expect me to call." Strange to say, this Chesterfield is always in demand. He is a good diner-out, because he appreciates a good dinner and he has a fund of just the sort of talk that makes him agreeable at table, so his hostesses pardon his rudeness and invite him again. But it is not every man who sets such a price upon his society or who is willing to have it known if he does. The wear and tear of business life in New York cannot be described, and I am not surprised that insomnia is the besetting ill of so many men. Their brains are so active that they cannot sleep. A friend of mine who works like a Turk, and who has one of those restless American brains, told me, not long ago, that he didn't believe that he averaged four hours sleep a night. That he frequently got up and went to his library, and read through the small hours, hoping that would induce sleep, but it didn't. He says that he expects nothing else but that his wife will shoot him for a burglar some night. I don't see how people can sleep after they do go to bed, even if they are sleepy—that is, if they have front rooms. Did you ever try to sleep in a front room in New York? If you haven't, don't, as it is not worth the trial. I sleep at the back of the house, which is pretty quiet, I admit; but every night my bed is shaken, and the globes rattle on the lamps, as a fire engine thunders through the street. My brother has a front room, but he says that he is getting hardened to the noises—the fire engines pounding over the stones, the sharp rattling of the coupé wheels, the loud voices of belated politicians (there is a political club across the street), and the slam-bang of the iron ash-cans on the paving stones, mingled with the soft Italian oaths of the ashmen. For six years, when I lived in another part of the town, the head of my bed was within seventy-five feet of the elevated railway track, and there was a station just outside of my window. Perhaps you think that it was less noisy to have a station there than for the trains to go crashing by, but you are mistaken. The stopping and starting, the shrieking whistle and hissing steam, were nerve-tearing beyond description; but I lived through it, and more than that, I slept through it. I do not, however, believe that my sleep was very restful, and I do know that I came very near breaking down, and probably would have done so but for a timely trip to Europe. Perhaps the elevated road was not wholly to blame, but after a hard-working, noisy, nerve-rending day it did not have the effect of lulling me to sleep. Fifth Avenue does not have the elevated road, but it has other noises almost as distracting, so that any one who has a bed-room on that fashionable thoroughfare must, necessarily, have a disturbed sleep. When I think of my room on a much-traveled London street, and another on the Rue di Rivoli in Paris, where the carriages chased each other in rapid succession all night long, and where I never heard a sound but the muffled beating of the horses' hoofs on the asphalt pavement, I couldn't but wish that we imported something besides the fashions of those two cities.

HYPOTHESIS AND PROOF.

THE MANY PROBLEMS OF NATURE BASED ON ASSUMPTIONS OF SCIENCE.

It is not going too far to say that the modern sciences of chemistry and physics are based upon theories which have never been proved to be true, but are, possibly, or even probably, unprovable. The two fundamental conceptions regarding matter and energy—the atoms and the ether—are assumptions, pure and simple, and the only justification we have for assuming their existence is the very strong one that they perfectly explain all the observed phenomena, and, even further, that by reasoning from them as a basis, we can predict what phenomena will occur under previously untried conditions, and have our predictions fulfilled when the proposed conditions are obtained. Take, for a single instance, the theory of atoms. It is a fact of common observation that all bodies, but especially gases, vary in volume or size under varying conditions of temperature and pressure. Now the human mind can form only two possible conceptions of matter—that it is perfectly continuous, or it is discontinuous. If a cubic inch of air, for instance, or the mercury in a thermometer, were perfectly continuous, or one solid lump of matter, so to speak, we cannot conceive of any way in which its volume could change; but we know that it *does* change, and we are therefore driven almost inevitably to the belief that matter is made up of separate particles (or atoms) separated from each other by empty spaces, like a swarm of gnats, to use a rough illustration. The atomic weights and other anatomical phenomena are hardly explainable upon any other theory than the mutual attractions of excessively minute but perfectly definite and unalterable masses of matter. But *are* the spaces between the atoms empty? Here we meet with another difficulty, for we know that energy, in the forms of light, heat, electricity, etc., not only passes readily through matter, but also across the inter-stellar spaces, where, for various reasons, we cannot admit the presence of matter in the forms familiarly known to us. We cannot conceive of energy or force traversing an absolute vacuum. The very existence of energy seems to be conditioned by the presence of matter. We are, therefore, driven to another assumption—that of the *ether*, which is supposed to be an extremely subtle form of matter, as much lighter than common gases, as these exceed solids and liquids in tenuity, which not only fills the inter-stellar spaces of the entire universe, but the inter-atomic (or, more prop-

erly, the inter-molecular) spaces of all forms of matter itself. But, if the ether is matter—and if it is not it has no existence—then it must be constituted very differently from other forms of matter with which we are acquainted, and possess a combination of qualities—such as low density and high elasticity—which are not possessed by any other form of matter of which we have knowledge. We have no actual and definite knowledge as to how matter is constituted, how energy is transmitted, or what light, heat, electricity, chemical affinity, etc., really are, and we are hardly able to thoroughly differentiate matter and energy themselves. Certain scientists have considered them nearly identical, holding that atoms are but centres of attractive force, or of vortices in the ether, like the rings of smoke blown from the chimney of a locomotive. We think that scarcely a single scientist of repute would claim to absolutely believe in the existence of either atoms or the ether. They simply stand as expressions by which observed phenomena can be formulated, or, as illustrated by Professor Cooke, they are but the scaffolding of an uncompleted building, to be removed when our system of the philosophy of Nature is complete, but in the present condition of knowledge serving a useful if not indispensable purpose. The more we search into the mysteries of Nature, the more incomprehensible we find them, and the more clearly we perceive the limitations of our present knowledge. It sometimes seems as if we must reason from a psychological standpoint, and refer natural phenomena to a subjective basis. But this is merely a fanciful speculation; the course of knowledge is ever onward, and we have no occasion for discouragement. We have but little doubt that in time many, if not all, of the problems of Nature will be solved, and shown to have a material and objective existence; and it is not impossible that we may obtain a comprehension of the true nature of vital force, or life itself, which we cannot but consider as the key to all those other mysteries which now perplex that manifestation of our being which we call the mind, or soul.—*Pop. Science News.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

April.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, cod, snipe, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, perch, rock-fish, salmon, smelt, whitefish, trout, sturgeon.

VEGETABLES.—Artichokes, beans, carrots, celery garlic, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

A LA MODE VEAL.—Take out the bone from a fillet of veal, and make a large quantity of stuffing of grated bread crumbs, a little finely minced suet, the grated rind of a lemon or orange, also the juice; some chopped stewed mushrooms, some grated yolk of hard boiled eggs and a little sweet marjoram. Fill the hole left by the bone with this stuffing and skewer it up. Draw strips of cold ham with a larding-needle all through the surface of the veal; or else press little bits of bacon into incisions made in the veal. Lay the veal thus prepared in a deep baking pan, putting some sweet lard around it and bake until thoroughly done. Remove the meat, skim the gravy and transfer it to a saucepan. Thicken with a little flour, add a glass of white wine or a little water, let it boil up and send to the table with the veal.

PIQUANTE SAUCE.—Put in a saucepan a bit of butter, two sliced onions, one carrot, one parsnip, two cloves, a little thyme, laurel, basil, two shallots, a clove of garlic, and some parsley; turn the whole over the fire until it be well colored; shake in some flour; moisten with some broth and a spoonful of vinegar. Let it boil over a slow fire; skim and strain through a sieve. Season with salt and pepper and serve with any fish or meat needing it.

SWEETBREADS AND MUSHROOMS.—Parboil sweetbreads and cut them into pieces half an inch square; stew them until tender; slice half a can of mushrooms and stew them in their liquor for an hour; add them to the sweetbreads with a coffee cupful of cream, pepper, salt and a tablespoonful of butter. Serve.

SNOW CAKE.—Beat two cupfuls of powdered sugar and half a cup of butter to a cream; add a cupful of sweet milk and the whipped whites of four eggs; flavor with almond. Sift a teaspoonful of baking powder into two and a half cups of flour and stir this into the cake and bake in a moderate oven three-quarters of an hour.

LEMON RICE PUDDING.—Boil one cupful of rice soft in water. Beat together the yolks of three eggs and half a cup of white sugar; mix with the rice, add one quart milk and the grated rind of a lemon and bake. When nearly done spread over the pudding the whites of the eggs beaten to a stiff froth with a cupful of sugar and the juice of a lemon. Set back in the oven and brown. Eat cold.

EGGLESS LEMON PIE.—Four pounded crackers, two cupfuls of water, one and a half cups of sugar, juice and grated rind of two lemons.

WHAT THEY ATE.

SOME OF THE GASTRONOMIC FANCIES OF ROYALTY AND GENIUS.

The meals of Charlemagne consisted never of more than four courses, and his favorite dishes were eggs and roast meat, particularly venison, which was served on long spits by his foresters. Luther preferred Torgau beer and hock to all other beverages. As a young man, Melancthon was very fond of barley soup, and he would often exchange a diet of meat for a bowl of barley soup. Small fish, vegetables and all kinds of farinaceous food he liked; but large fish and meat he disliked, and he hated all public meals or drinking bouts. Torquato Tasso was very fond of preserved fruits and all kinds of fancy sweets. Henry IV. was often ill from eating too many oysters or melons. His favorite drink was vin d'Arbois. Peter the Great liked nothing better than Limburg cheese. Charles XII., King of Sweden, preferred a piece of bread and butter to anything else. Voltaire, like Frederick the Great and Napoleon I., was very fond of coffee. His favorite food was oat-cakes, but he preferred oranges to any other kind of fruit. The Dutch lady scholar, A. M. Schurmann, ate spiders as a delicacy. Lessing preferred lentils, and Klopstock, who was a real gourmand, fed on salmon, mushrooms, pastry and smoked meat. Of vegetables he liked peas best, and grapes as dessert, together with a bottle of good claret or hock. Kant retained till his old age a preference for pork, all kinds of pulse and stewed fruit. He devoted three hours a day to his dinner. Schiller was in his youthful days very fond of ham. An old note-book belonging to a Stuttgart restaurant contains some items about "Meals for Dr. Schiller in 1782," from which it appears that, besides a bottle of wine, ham was every day among the dishes on Schiller's table. Matthisson confessed a preference for peas, beans and pork; Lord Byron for Chester cheese, with ale or porter; Pope was "greatly interested" in venison; Jonathan Swift in Turbot, and Sir Walter Scott in roast goose.—*Pall Mall Gazette.*

FASHION'S FOLLIES.

A FEW FREAKISH FADS OF FASHIONABLE FANCY.

One of the newest and most startling fads is the monocle for women. I fancy very few will adopt this fashion, as it smacks too much of the ultra sensational. Still, there are always a few audacious dames who will take up any fad provided it only has the charm of novelty. Such an one I saw at Sherry's the other day. She created a breeze as she came in. She was tall, superbly modeled, and her black-cloth gown was exceedingly smart. She carried one of those Tosca-handled umbrellas, wore long black gloves, a choking linen collar; and had a monocle stuck in her eye, and the *tout ensemble* was decidedly and unmistakably Frenchy. She had some trouble manipulating her new toy, dropping it once or twice in the bouillon, but succeeded on the whole very well, and managed to get stared at to her heart's content. Another ultraism is the cut glass dumb-bell which the girls who go in for athletics are using now. This is the latest aristocratic London fad, and therefore "goes" without saying here. Every smart girl will have her crest or monogram emblazoned upon the dumb-bells. Fancy the pretty effect when a long line of lovely athletes are turning and twisting these shining, glittering bells. Still another fad is perfumed ink. We have had our clothes, our stationery, our furniture perfumed, and now our ink must give forth fragrance and make our epistolary efforts smell all over like a waft from Araby the blest. Pencils of perfumed crayon are sold now, with which you can wet and mark your bodices and avoid the use of sachet bags, or the practice of wetting any part of your costume with extracts. Do your old love letters vex or reproach you with their unwelcome sight? Do you long to be rid of them and yet dislike to destroy them? Very well. I will tell you what to do with them. Make them up into a sofa pillow! Lose them in eider-down, and cover them with silk or satin, and when weary of everything drop your pretty head on them, and fall a-dreaming of all your triumphs past and gone, of Jack's eyes, or Harry's poetry or Tom's vow of constancy. Pretty idea, isn't it? and one which many bewitching coquettes are carrying out these days. We have had watches set in bracelets, umbrella handles, and in pocketbooks. Now we are to wear them depending from a tiny chain hanging from a brooch. Fine gold chains fitting close about the wearer's throat are the rage. Some are double and others of three strands, the third garnished with pendants. Buckles grow larger and more astonishing in design. Happy the women who can contrive something unique for a belt, buckle or girdle. A little woman of inventive turns had two bracelets formed of oynx medallions set in copper. They were heir-looms, and hideously ugly for the wrist. She had them joined and carelessly looped from one side of her Zouave jacket to the other, and they at once became a thing of beauty, their variegated tones harmonizing admirably with her gown. For trimming light and fleecy ball dresses there is nothing newer or more unique than the trellis work flower arrangements. The trellis is made of India rubber stalks, and must be artfully and thoroughly concealed by flowers which can be trained in a pliable and graceful manner, such as apple blossoms, violets, clematis and wild roses. Tight sleeves are entirely out. The leg o' mutton, the bishop, and nameless things in puffs, bunches and gathers have driven them away. Even the sleeves of re-vamped dresses must have a simulated puff on the shoulders to finish and freshen them a bit. Sleeves of evening gowns are simply epaulettes of gauze or tulle, in which nestle butterflies of gems or knots of ribbon. Huge sleeves of velvet freshen a cloth costume more than any other

renovation. The favorite bonnet for evening is a crownless twist of pale blue, pink or yellow crape; gold embroidered, with an aigrette of gold and a few soft loops of the crepe in front. These are a trifle newer than the flower bonnets, and very effective if one has soft, fluffy hair. All the Felix bonnets are close-fitting tuscan braids, with a wreath of roses inside the brim, close to the face, tied with velvet ribbon. Just the sort of bonnet your mother wore when she was sixteen—a demure and coquettish affair. Lace is again used to droop over the brim, and is very effective as it softens a soft face and enhances the beauty of a young, fresh countenance. The latest fad for the hair is the bleached white lock just above the forehead. This started in Paris, and has been slowly advancing until it struck Broadway a few days since, and paralyzed all beholders. It is of course adopted by the women who have bleached, gilded, and reddened their locks. It is startling—almost fiendish in effect. Another innovation in the hair line is the jeweled clasp for fastening the tresses by a flat diamond, with the rim and handle of the clasp formed of tiny diamonds. Small looking-glasses are the newest ornaments for dinner-tables. They are mounted on gold and silver stands, engraved with crest or monogram, and placed before each guest. It is such a comfort to look over and see that your bang is all right, and note whether the powder is off your nose. One of the newest fads in the complexion line is to go to some specialist for massage of the face. If you are fortunate and possess a maid, you must take her with you, and have her acquire the art. Then, with an extensive collection of creams, lotions, balms, etc., and the dainty pats, manipulations and pinchings your Dorcas gives you, you should be able to keep the wrinkles away, despite late hours and indigestible suppers. Don't, I beg of you, allow you vowels to flatten or shorten. You know how we learned to write the English hand, don't you? Well, there are "social assistants" at the women's exchanges who take pupils and teach them to talk as broad English as the Duchess of Marlborough. The keynote is "far." Remember. Now, give "a" in the words cat, can't, basket, glass, hand, have, land, stand, man, the sound of the vowel in "far," and you have the London accent. Make rhetorical sandwiches of "oh, deahr, no," and "don't you know," and if you are clever, and affect severe styles, you can make the world believe you are "just over."—ADELE CLAY in *Chatter*.

DEEP-SEATED ASSOCIATION.—"That's what beats me," soliloquized the small boy, as he gazed at his mother's slipper.—*San Francisco Call.*

ATTENTION, YOUNG MEN!—As we have before remarked, there is a large and increasing demand for good electrical engineers. If a young man, about to enter college, is hesitating as to what course to pursue, our advice is to study electrical engineering and, after graduation, to enter some large electrical company's shops, don blue jean overalls, and get about two year's practical experience. Then we think he is perfectly sure of a good position. Over $80,000,000 new capital has been invested in the electrical industry in this country during the past year, and in England, during one week, 21 electrical companies were organized. This shows how rapidly the industry is growing.—*Electrical Review.*

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PROF. PHONOGRAPH.—Edison's phonograph has found a new application at the Milwaukee College, where it will be used as an assistant in teaching the French and other foreign languages. The phonograph, of course, never gets tired, and can be made to repeat the same sentence or the same word hundreds of times. In giving a lesson the teacher reads it before the phonograph, at the same time addressing the pupils, and the lesson is reproduced whenever wanted.

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Old-time Disadvantages —Paterfamilias—My boy, George Washington, couldn't tell a lie. The Boy—Naw, nor he couldn't pitch a curve.

A Record of Blood.—George: "What a fine building that is across the way."

Charles: "Yes, yes; but the owner built it out of the blood, the aches and groans of his fellow men; out of the grief of crying children and the woes of wailing women."

"Ah! a rum-seller, of course. Yes, yes!"

"Oh, no; he's a dentist."—*Brewers' Journal.*

What we are coming to.—Old Dr. Bilgus had been attendi g a patient without benefit to the latter, and it was decided to employ another physician.

"We'll have to call in another doctor," the patient's father said to Bilgus, "James is getting no better, he's in a high fever——"

"Why didn't you tell me he had fever?" broke in Bilgus. "I've got just as good fever medicine as any other doctor."

Curious Mental Trait.—A correspondent of the German Anthropological Society tells of his meeting a farmer by the name of Lowendorf, who had a peculiar habit of writing "Austug" for "August," his Christian name. Some years later he was inspecting a school, and heard a little girl read "leneb" for "leben," "naled" for "nadel," and the like. Upon inquiring, he found that her name was Lowendorf, and that she was a daughter of his former friend, the farmer, now dead. This defect was noticeable in the speech and writing of both father and daughter. It appeared in the father as the result of a fall that occurred some time before the birth of his daughter.

Music in Gas.—A musical gas machine, called the pyrophone, has been brought out in England. Its compass is three octaves, and it has a keybord and is played in the same manner as an organ. It has 37 glass tubes, in which a like set of gas jets burn. These jets, placed in a circle, contract and expand. When the small burners separate, the sound is produced; when they close together the sound ceases. The tone depends on the number of burners and the size of the tubes in which they burn, so that by a careful arrangement and selection all the notes of the musical scale may be produced in several octaves. Some of the glass tubes in which the jets burn are nearly 11 feet long.

Parisian Gold Thimbles.—Thimbles as ordinarily made are of solid metal—iron, steel, silver or gold. The metal is pressed into dies of different sizes, and the thimbles are punched, polished and tempered afterward. A few are made of brass and washed with some white metal. In Paris they make gold thimbles for use and durability. A disk of sheet iron is punched into a hole which gives it its shape. Then the little hollows for the needle are made and the thimble is perfectly finished and finally converted into finely tempered steel by a peculiar process. It is then a fine steel thimble that will last a lifetime or longer. It is next lined and covered with gold leaf, so put on that it will last many years, and of course can be renewed when it wears off. It is said that such thimbles are made nowhere but in Paris.

Story with a Moral.—The Philadelphia *Times* says: "As a syrup maker was peacefully preparing for work among the maples, he became aware that Indians were stealing upon him and were already in possesion of his canoe. Whatever was to be done had to be done quickly, and frontier wit was equal to the emergency. Snatching up his deep kettle, he inverted it over his head and boldly waded into the river. The inverted kettle acted, of course, as a diving bell, and with his head in this air chamber he walked across the river, which in the middle was many feet over his head, to the utter amazement of the Indians." The moral of this is that every bottler should have a syrup kettle handy, and if he sees "Injuns" skulking around the factory he can just put on the kettle and walk across the river. But it wouldn't work werth a cent trying to get away from a drummer that way.

The World's Universities.—Norway has 1 university, 46 professors and 880 students; France has 1 university, 180 professors and 9,300 students; Belgium has 4 universities, 88 professors and 2,400 students; Holland has 4 universities, 80 professors and 1,600 students; Sweden has 2 universities, 173 professors and 1,010 students; Russia has 8 universities, 582 professors and 6,900 students; Portugal has 1 university, 40 professors and 1,300 students; Denmark has 1 university, 40 professors and 1,400 students; Spain has 10 universities, 380 professors and 16,200 students; Italy has 17 universities, 600 professors and 11,140 students; Switzerland has 3 universities, 90 professors and 2,000 students; Germany has 21 universities, 1,020 professors and 25,000 students; Great Britain has 11 universities, 334 professors and 13,400 students; Austria has 10 universities, 1,810 professors and 13,600 students; the United States of America has 360 universities, 4,240 professors and 69,400 students.

Ingenious Watch Dial.—The changes which the flight of time brings upon humanity afford an inexhaustible subject for the lover of the curious in art and nature. As a notable specimen of emblematic work of a very appropriate and felicitous kind, a watch dial now in course of construction at Waltham, Mass., is mentioned as one of the most wonderful of the many wonderful pieces of mechanism which have been constructed by the deft-fingered artists. It contains, instead of the usual numerals, twelve small, but distinct, silhouette figures, beginning with a woman with a very young child in her arms. At 1 o'clock the lady and her little baby are clearly depicted, the infant being in long clothes. At 2 o'clock the same figure appears, but the child is a little larger. At 3 o'clock mamma is still there, but the infant is in short clothes. At 4 o'clock the child again appears, and so on up to 8 o'clock when he goes to school for the first time. At 9 o'clock he may be seen again in college gown, which is being contemplated by his now elderly mother. At 10 o'clock the death bed scene is presented, where he parts with his beloved mother. At 11 o'clock he, too, is a middle-aged man, over whom the snows of many winters have passed. At 12 o'clock he makes his final appearance, an old and decrepid specimen of humanity, praying for the end.

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CONTENTS.

FOOD AND COLOR.

German scientists have recently been investigating, with interesting results, the changes to which animals are subject in their color through the action of special foods. The results thus far announced are most marked in the plumage of birds. Dr. Sauermann who subjected the action of cayenne pepper on canary birds to minute researches, demonstrated that feeding with the coloring matter of cayenne pepper, capsicine, alone fails to cause a change of color in the birds, but that the presence of trioleine together with the coloring matter has the desired effect. Further experiments in the same direction were performed with young white Italian hens. By feeding them with cayenne pepper, in one of the hens yellow-red feathers appeared before the tenth day was over. After full growth the hen was red on the breast and on the upper part of the wings, yellow-red on the remainder of the body. A second has remained white with red breast, the others fail to show any modification in their coloration, except the feet becoming yellow-red, as in all of them. Old hens did not show any red coloration, but the yolk of their eggs took a reddish coloration, which may have its cause in the trioleine contained in the yolk. A highly interesting case of this kind was recently published in the Monthly Review of the German Society for the protection of birds. By mere accident, a pair of doves obtained some butter which they relished very much. Then, they were treated every day to a piece of butter of the size of a hazelnut. The remarkable result was that their plumage took a deep brown, lustrous coloration. As a counter-experiment, the doves were deprived of butter for some time, when the dark coloration gradually disappeared. A similar fact has been reported by the scientific traveler, Dr. Ehrenreich. He stated that certain Indian tribes were in possession of the art of changing red and green parrots into partly yellow ones by a certain peculiar food. The red color of bullfinches, which soon disappears, when the bird is kept in cages, it is stated may be restored by feeding the bird in spring with the young shoots of pine-trees. We are all familiar with the often repeated experiments on caterpillars by variation of plants on which they feed. The most remarkable of them is a species, which, after been fed with walnut leaves, for instance, produces butterflies of a completely dark color.

ADULTERATED BEER.

As the readers of the AMERICAN ANALYST have already been informed, Senator Stewart, of Nevada, has introduced a bill to regulate the manufacture, sale and importation of lager beer. So far as this bill can reasonably be expected to prevent the adulteration of lager beer it is to be commended ; but so far as it seeks to extend the vicious and unjust taxation scheme now in operation on oleomargarine, it is to be condemned. Adulteration should be prevented, and laws can be framed to this effect without any taxation addenda. The bill in question declares that pure beer shall consist of hops, malt and water. There is plenty of beer made only of hops, malt and water which yet is unfit for human drink, because not having been properly fermented it contains too much yeast, and irritates the stomach, bowels and kidneys. We do not take any stock in sensational stories about the manufacture of beer, such as that the brewers use the poisonous fish-berry to increase the intoxicating qualities of their product. A brewer has his capital at stake and is generally careful not to do anything that will ruin his trade. For much of the poor beer in market, the public is to blame. The popular demand is for a bright, clear beer, at the temperature of ice water. It is an impossibility to brew a good, wholesome and nourishing beer that will remain bright and clear at this temperature. Consequently, to satisfy the public demand, various tricks have to be resorted to, such as a decrease in the albuminoids and extractive matter, and an increase in alcohol. Another source of trouble is the demand on the brewer for a cheap beer, one which can be sold at seven cents for a nominal pint, or in reality three pints. Consequently, brewers who furnish such a beer cannot be expected to be able to supply a beer of such a quality that anyone would be willing to pay five cents a glass for it. Those brewers who try to make different qualities of beer to suit the pockets of their customers, generally fail in making good beer, even where they claim to have the best quality. In such cases the drivers of the delivery wagons frequently make mistakes in giving poor beer to those who pay for the best, though we have never heard of any of the best having been delivered by mistake to those who pay for the inferior article. It may also be said that the use of rice and corn as a substitute for malt is largely due to the erroneous idea of consumers that a light colored beer is less intoxicating than one that is darker. More rigid laws against poor beer are needed, and, if properly enforced, can do much towards improving the wholesomeness of this popular beverage. Much could be done in this direction by better instruction of the consumer, and removing from the popular mind much that is erroneous.

MILK-POWDER.

A factory has been established in Gossen, Switzerland, for the preparation of a perfectly dry extract of milk in powder form. This powder is of a yellowish white color, and contains nothing but the dry extract of milk. It is put up in tin cans. The *Chemische Zeitung* says the cans contain 125 grams (about 4 ounces) net of the powder, the contents being exactly equal to 1 litre (about 1¾ pints) of milk. G. Ambuehl gives the following analysis :

	Powdered Whole Milk. Per cent.	Powdered Skimmed Milk. Per cent.
Water	3 92	4.17
Milk fat	26.04	1.65
Albuminoids	24.38	35.56
Milk sugar	38.51	52.37
Salts	7.24	7.51

A VALUABLE RELIC.

It is said that the original telegraph instrument used by Professor Morse, at Washington, to send the first message ever transmitted by his system, was not destroyed, as has been currently reported, but that it was in Morse's possession a very short time before his death. A memento like this would be of incalculable value, and its careful preservation should be a binding duty upon whomsoever might have it in possession or know of its whereabouts. The *Electrical Review* makes the pertinent suggestion, with which we heartily coincide, that if it is still in existence it should be deposited in the National Museum by the side of the companion instrument used by Mr. Vail, for which the owner is trying to get $10,000, or it should be sent to the museum of the New York Electric Club.

PREHISTORIC AMERICANS.

A despatch from Parkersburg, W. Va., dated April 15, says that the site of a prehistoric village has just been discovered on the Ohio side of the river, about one and one-half miles north of that city. The town site comprises an area of about four acres, and over the entire area the earth is generally slightly burned, having a reddish color, and is thickly intermixed with fragments of pottery, streaks of ashes, and fragments of bones of animals and human beings. In several places are to be seen the ruins of what seem to be ancient fire-places, containing charcoal, intermixed with charred nuts of various sorts. In and around these fire-places are found ornaments and implements, such as battle axes, belts, knives, drills, spear and arrow points, and ornaments made of bone and slate. The spear and arrow heads are of fine workmanship, and are all of very hard substances as agate, chalcedony, carnelian, quartz, jasper and slate.

ANCIENT WINE.

WHAT WE KNOW ABOUT THE WINES OF PRIMITIVE TIMES.

It is impossible to trace the history of wine back to its origin; for that drink is almost coexistent with man's knowledge of the vine. Men probably were not slow in discovering that the fruit of the vine constituted a pleasant and useful portion of their aliment, and the juice expressed from it a cooling and toothsome drink. From this stage it was but a single step to the adoption of vessels for preserving any superfluity. By being kept, a spontaneous fermentation ensued, which imparted to the liquor "a vinous quality" and a more excellent flavor—a process which may be illustrated by the methods in use among primitive nations at this day, who, discovering by instinct or experience that the sap of the palm tree has a sweet taste, in the first place make incisions in the bark, and drink the liquid exuded; but soon finding that by being kept in vessels the liquid acquires different and more agreeable qualities, they keep it for long or short periods, according to their fancy. "It is impossible," says Mr. James Samuelson, in his "History of Drink," "to retrace the history of any of the nations of antiquity to a period when strong drink was unknown;" and the full force of this concession is only understood when we remember that Mr. Samuelson holds a brief for the teetotallers, and would fain, if he could, find such a golden age. In ancient Egypt, in China, India, Persia etc., we know indisputably, from literary and mural monuments, that wine was manufactured and highly appreciated; and the Old Testament affords us sufficient evidence of its estimation among the Hebrews. Whence was the vine primarily derived? Where was its first home? That is a question impossible to answer at present, and one which has always caused dissension amongst botanists. It is not definitely settled, though it seems to be pretty generally acknowledged, that "it is indigenous throughout the whole of that vast tract which stretches southward from the woody mountains of Mazanderan on the Caspian to the shores of the Persian Gulf and the Indian Ocean, and eastward through Khorassan and Cabul to the base of the Himalayas, the region to which history and philology alike point as the cradle of the human race." According to "the best and most ancient historians" (to use a phrase of Sir Edward Barry's), who are unanimous on the point, the rules for the culture and preparation of grapes and wine were delivered down to the Asiatics and the Greeks, who were the chief peoples to improve them and carry them to greater, perhaps to the greatest, perfection by the Egyptians, who had in their turn probably acquired the art before the great emigration. Pliny and Columell set down the number of varieties of the vine known down to their respective days at about fifty, from which something above an equal number of wines was manufactured. But Virgil, who, besides being a great poet, was a zealous agriculturist, says in the "Georgics" that one might as easily attempt to enumerate the sands of the sea-shore as the different kinds of wines that were in use; and he was probably to a certain extent right, for as some one else says: "From the difference of the soil, climate and culture, and the innumerable species of grapes, an almost infinite variety of wines was produced . . . and the difficulty of ranging them in any regular order is increased by the transplanting of various vines, by which their natures and various qualities were either improved or degenerated, as the soil was more or less favorable than that from which they were removed." In Greece the vintage was in September or October, according to the position of the vineyards. If they were situated in a warm, low land, the grapes were the sooner ripe; if on the hill-sides, the harvest would be about a month later, or towards the end of October; and as most of the vineyards were on hilly situations, the harvest cannot be said to have been in full operation until this latter date. The process of manufacture was almost in every respect the same in Italy as in Greece, and what is said of the one will, with certain exceptions to be noted when they occur, apply equally to the other. After the grapes had been gathered, and the unripe or rotten bunches carefully removed, they were carried to the treading-house and poured into a shallow vat, where they were immediately trodden by men, who moved in time or danced to music played on the scabellum by a person engaged for the purpose. The treaders varied in number from two to eight or ten, or even more, and after they had done their work the grapes were subjected to the more powerful pressure of a thick, heavy beam of black maple, called the prelum, which was either screwed or lowered down upon them in order to obtain the last remnant of juice. This, when the vat was small, ran through the apertures into wide-mouthed jars, whence it was transferred into casks; but when the vineyard was extensive, and the vat correspondingly large, the must ran into another vat of equal size sunk below the level of the ground, all solid particles being arrested in flowing through the apertures by a colander attached thereto. The must—the sweet unfermented juice—was of several kinds, "according to the manner in which each was originally obtained and subsequently treated." That which flowed from the fortuitous pressure of the grapes upon one another in the baskets before the treading was reserved for making a particular species of rich wine, to which the inhabitants of Mitylene gave the name prodromos or protropos, and which they kept preserved from contact with the air until the succeeding summer, when they exposed it during forty days to the strongest heat of the sun. When the quantity of juice obtained by this casual contact was either too small or not sufficiently saccharine to enable it to keep without further preparation, the must that collected in the vat, before the grapes had been fully trodden, was put into an amphora, properly coated and secured with a well-pitched cork, and sunk into a pond or into the sea, where it remained a month, or until after the winter solstice. When it emerged it was commonly found to have lost all tendency to ferment, and was then something between a syrup and a wine, of delectable flavor but very strong. After the grapes had been fully trodden and pressed, the edges of the husks were cut, and by further pressure an inferior wine was obtained, which was called vinum tortivum or circumcisitum. The pressed skins were next thrown into casks, and being fermented with a quantity of water, furnished the thinnest drink of all; the Greeks gave it the names deutrios and thamna, and the Romans that of lara; and they both left it to their slaves. Some portion of the must was used immediately after it had been pressed, and was drunk fresh when clarified with vinegar. Two modes for preserving it have already been described; another was by boiling, by which process it became inspissated—grape-jelly is the term applied by Professor Ramsay to all such preparations; and we learn from Pliny and other writers that they were very extensively used for giving body to poor wines and making them keep. The residue of the must—all that not applied for the purposes already mentioned—was conveyed from the *lacus* to the *cella vinaria*, a cool room with usually a worthy aspect, and three or four steps below the level of the treading place, where were ranged the *dolia*—long bell-mouthed vessels of earthenware, sunk one-half or two-thirds of their depth into the ground, according to the anticipated strength of the wine with which they were to be filled; it was in these vessels that the fermentation took place, and extended over nine days; and after this had subsided, and the must had become wine, the vessels were closely covered. Not, however, until certain ingredients had been added for the improvement of the liquor, such as salt water (in the proportion of one to fifty), powdered pitch or resin, the infused flowers of the vine, pine or cypress leaves, bruised myrtle berries, shavings of cedar-wood, bitter almonds, etc. At this time also, if at all, the inspissated must was added, and, when this was so, the common mode of procedure was to mix the latter with any or all of the aforementioned medicaments, boil the whole, and then add a small portion to a given quantity of new wine. Once in a month the coverings of the vessels were removed, in order to ventilate the contents and to remove any scum—particularly the *flos vini*—that might be thrown up. After being left in the vessels for a period usually extending over some months, the better kinds of wines were drawn off into *amphoræ* or jars, while the commoner sorts were drunk direct from the larger vessels. The *amphoræ* were carefully stoppered with cork or wooden plugs, and liberally besmeared with pitch, and were then removed to the store, a place where all the valuables, gold, wines and fragrant oils were kept, and one which found a place in all houses of importance, even so early as the Homeric age, since in the "Odyssey" (II. 340) we are told that Telemachus, when about to set out on his voyage to Pylos, "stopped down into the vaulted treasure chamber of his father, a spacious room, where stood . . . . casks of sweet wine and old, full of the unmixed drink divine, all orderly arranged by the wall." This storeroom for wines was commonly at the top of the house, and not underground, as in this instance, in order that the rays of the sun might shine in all their power and bring the wine more speedily to perfection, and they even exposed it for lengthy periods in summer on the house-tops with the same view. Old wine was considered more grateful to the palate, though Greek wines, it would seem, did not require so many years to ripen as did the Italian. In the "Odyssey" we are told that Nestor drank wine ten years old, and Athenæus mentions some kept for sixteen years; but the connoisseurs of that country declared

that "all transmarine wines arrived at a moderate degree of maturity in six or seven." Many of the Italian varieties, on the other hand, required to be kept for sometimes twenty-five, commonly twenty years, before they were drinkable; and even the poor Sabinum growths required fifteen years. This being so, it became a matter of importance to hasten by a variety of means the natural process. Most of these devices have been described: the application of the *fumarium*, which had been borrowed from the Asiatics; the insertion of some of the numerous condiments already mentioned, or the immersion of the vessels containing the must in a pond or in the sea, by which an artificial mellowness and a totally different fermentation were induced. Considering the number of ingredients that went into the various wines, it is not to be wondered at that a large quantity of dregs and sediment were contained in the liquor, and these it was necessary to separate before it was drunk. Several of the medicaments already enumerated answered the two-fold purpose of perfuming and clarifying the wine; but the thing expressly adopted for fining was white of egg (pigeons' eggs being preferred by the fastidious), or white of egg whipped with salt. We have already seen that varieties of sweet wines were manufactured by checking the fermentation; others, again, were made by partially drying the grapes, or by converting them completely into raisins. The *glukos oinos* of the Geaponic writers, and the *vinum dulce* of Columella, belong to the first class; the *vinum diachytum*, the grapes of which were exposed to the sun for seven days upon hurdles, belongs to the second; and the *passum*, or raisin wine, to the third. Professor Ramsay, in describing this last, says that the grapes were dried in the sun until they had lost half their weight, or they were plunged in boiling oil, which produced a similar effect, or the bunches, after they were ripe, were allowed to hang for some weeks upon the vine, the stalks being twisted or an incision made into the pith of the bearing shoot to put a stop to vegetation. The stocks and stones were removed; the raisins were steeped in good wine, or must, and then trodden or subjected to the press. The quantity of juice that flowed was measured, and an equal quantity of water added to the pulpy residuum, which was again pressed, and the product employed for an inferior *passum* called *secundarium*. The grapes accounted most suitable for *passum* were those which ripened early, especially the varieties *Apiana* (Greek *Sticha*), *Scirpula* and *Psithia*. The *passum* of Crete, according to Martial, was most prized, and next in point of excellence came those of Italy, Cilicia and Africa.

ORIENTAL MAGIC.

VARIOUS PHASES OF NINETEENTH CENTURY OCCULTISM.

The last issue of the *Journal* of the Anthropological Society of Bombay contains a curious paper by a Mr. Rehatsek on twenty of the branches of eastern magic, all of which are in vogue at the present time. The first of these is the "Arcana of Letters and of Names," by which letters and figures are combined into magic squares, incantations, etc. These derive their power from the "arbitrary use of them made by the spirits governing the natural world, in such a way that the ninety-nine beautiful names of God and other divine words formed of letters containing the Arcana, which passes into material substances, intercede." The magician, of course, is the sole interpreter of the uses and significances of combinations. Alchemy comes next, and is followed by astrology, the most popular of all the eastern occult sciences. It is practised on all occasions to discover thefts, to foretell the result of a journey, the future of an infant, etc. Another popular practice is soothsaying from the sacred books, by opening one at random and placing the finger on a line. This is almost the only one of the sciences which cost nothing and which every one can practice. The selection of days is a subordinate branch of astrology, and is employed to ascertain what days are lucky or unlucky for the commencement of certain enterprises, the wearing of new clothes and the like. Divination and the interpretation of dreams are common everywhere. Summoning and subjugating demons is the most fearful of the magical sciences. There are two kinds, one dangerous and embracing unlawful magic, the other religious and consisting mainly in confining demons in flame, so that they are compelled to obey the commands of the magician. Geomancy is practiced by means of dots made with a pencil and arranged in complicated combinations so that they answer questions. The art of invisibility appears to be only known by name to Mr. Rehatsek, for he does not describe it. Jefr is a science which is known only to one family. It is defined as "the general science concerning the Tables of the Eternal Decree and of Predestination," and enables adepts to know all that has happened, is happening, or will happen in the most remote future. Palmistry, phylacteries, physiognomies and prayers explain themselves. Phantasms is the name given to the art of producing images in the air by incantations, aided usually by drugs and fumigations; while predicting from the past is exercised by studying the occult analogies between the past and future. Sorcery is the term applied to all the phenomena produced by magicians and popularly attributed to supernatural powers. It is divided into lawful or divine and satanic or black magic, the latter owing its power to evil spirits. The last of the magical sciences is soothsaying from trembling, by which the future is known from the involuntary movements of the body, a particular star controling each particular part of the human frame.

COMFORTABLE HOUSES.

SOME OF THE REASONS WHY HOUSES ARE COLD AND DAMP.

A large proportion of the colds and ailments of the respiratory organs suffered during this season of the year are attributable to the want of proper measures being taken by builders in laying foundations and in executing the basements of our houses. Hundreds of the houses let in the suburban districts of London are built upon clay and marshy ground, often of "made earth" and rubbish. The present by-laws as to foundations and building sites have been in operation only a few years; but previous to that time houses were built upon decaygin matter deposited by dust contractors, the foundations of walls were laid on the damp soil without concrete or proper courses to prevent the rising of damp in them, and damp earth was allowed to extend above the basement floor level. By the legislation of recent years, these matters have been more looked after by the district surveyor. We may point now to a few of the causes which contribute to cold and uncomfortable houses. First and foremost is the imperfect arrest of dampness from the soil. The only way of securing a healthful house is to cut it off as much as possible from the soil on which it stands. Ideally, one may imagine a house standing on stilts or piers, having a free current of air below, and a stair up to the floor; but this would be unattainable under existing arrangements. The next best thing is to obtain a well ventilated cellar, or, what is almost as good, a sufficient air space between the ground and the floor, this space being well ventilated by bricks, and the ground covered with asphalt or concrete. Neither of these essentials is found. There is an air space below the floor; but it is generally a rough and unleveled surface of rubbish, with the air bricks so scantily introduced, and they often clogged up by earth or dirt, that the air is in a state of stagnation, and the emanations from the soil are sucked up into the house by the warmth and fires. Another danger is added if a disused cesspool or a drain is beneath the house, and who knows how many of our houses are built over these receptacles of a past civilization? The many houses and tenements built almost level with the ground are particularly open to suspicion. A fast decaying floor or a mildewed appearance of dampness, or a musty smell under oilcloth or linoleum in the hall or passage will reveal the evil. On examination it is found, on taking the rotten boards up, that the joists are close to or rest on the ground, that the bond timber is rotten, or no damp proof course inserted. Hundreds of small houses are found yearly in this condition of incipient decay, which often begins under the passage floor, near the staircase or back door. The only remedy is to excavate the soil, underpin the walls, and lay a damp course over soil, replacing the timber on sleeper walls of proper construction. The want of ventilation is usually found to be the cause. Houses having half basements or parlors below the ground floor are very common in the metropolis; but these as living rooms are highly objectionable, with the exception of those which have not been excavated, and are built up from a lower natural level in the rear, in which case the lower story becomes the ground floor story of the house behind. Then it becomes necessary to form a good area or retaining wall in front to give light to the front room, or, if there is no front room, to well line the wall forming the back of the room in the rear with some bituminous compound. It is better, perhaps, to make it thick and hollow, ventilating the space. And speaking of half basements leads us to dwell on one or two points connected with dry areas. Walls built against earth ought to have an area formed along it of its whole height. On the return side of semi-detached houses the side wall must be built often without any area, and in this case the space next the wall for a foot or more should be filled in with broken stone, and a drain be placed at bottom just below the level of footing. An asphalt coat on the outer face of wall returning in the joint at the floor level should invariably be put. A more efficient protection would be an area covered over next the outer wall, called a "French intercepting drain," or a concealed area. Sometimes an impervious tile facing has been placed against the outer face of a wall so built; but of all these plans the open ventilated area is the best. We have here referred chiefly to foundation and basement measures; but the dry wall and the well protected roof are other necessaries of warm and healthful dwelling houses.—*Building News.*

SILK.

WHY ITS MANUFACTURE IS EXPENSIVE.

To produce sufficient silk to make a dress requires more time and capital than most people would imagine, remarks a contemporary. If we take one and a quarter pounds as the weight of pure silk required, this would be equal to two pounds of raw silk. To produce two pounds of raw silk would require the entire silk obtained from 7,000 to 8,000 worms, allowing a percentage for death by disease and other casualties. It may be interesting to state that these young worms, when newly hatched, would scarcely weigh one quarter of an ounce, yet in the course of their life, which only lasts some thirty or thirty-five days, they will consume about 3,000 or 4,000 pounds of leaves, and increase in weight about 9,000 times. Consumers of silk will not wonder at its high value when they consider that, to raise two pounds of raw silk, so much time and money are required. Besides the original cost of the eggs or young worms, they require feeding at regular intervals daily with mulberry leaves during their life. This is a large item of expense, if the cultivator does not grow and gather his own leaves, but is compelled to purchase them.

A MINERAL PALACE.—Colorado is enthusiastic for the World's Fair, and promises to duplicate at Chicago the mineral palace now building at Pueblo. The mineral palace at Pueblo is to be a permanent building, and is constructed entirely of the products of the mines of the State. The palace is 242 feet long, 128 feet wide and 70 feet high, and after it is completed there will be minerals enough left in Colorado to build who shall say how many thousands more.

A NATIONAL GARDEN.

A PROPOSED HORTICULTURAL AND ZOOLOGICAL PARK IN THE DISTRICT OF COLUMBIA.

The Washington correspondent of the Boston *Transcript*, under date of April 4, discusses as follows a project that we do not believe the general public is yet acquainted with:

One thousand acres or thereabouts will be the area of the proposed National Park at Washington. At all events, conspicuous members of Congress make confident prediction to that effect. Legislators at the Capitol are beginning to realize that the 131 acres already appropriated for the purpose are not enough; they would give space for a big zoological garden and for very little else. But the chief playground of so rich and vast a country as the United States should be on a larger scale than this. If the bill creating the Columbus Memorial Park becomes a law, a considerable tract will be added along the banks of Rock Creek; but even this is not sufficient. And this fact is beginning to be so generally felt that the passage of a measure providing for the purchase of enough more land to make up something like one thousand acres in all may be safely expected to pass before the close of the next session. The National Park, from this enlarged point of view, is to be not only the greatest place in the world of assemblage for beasts, fowls and fishes, but a paradise in the broadest attainable sense, resembling as nearly as possible the Eden of Mesopotamia seven thousand years ago. It will be a miracle of landscape art, equipped with everything that contributes to the beautiful in Nature, and more particularly will it be a garden of plants. Part of the plan already entertained is to double the provision of money for the plant-propagating establishment here, in order that what is now a picturesque wilderness merely may be made to bloom and blossom like the rose. Now, this propagating concern is the largest and most complete in this country, and one of the finest in the world. The beauty of Washington as a city is largely made by it. Just at present it is engaged in producing vegetables of a flowering and otherwise ornamental description for the decoration of the Capitol, at the rate of 350,000 plants a year. At this season, when things are beginning to grow, it ought to be of interest, not only to amateur horticulturists, but to every one, to know how such exquisite products of the soil are turned out on scientific principles. If you have any plants of your own under cultivation, you had better read this and learn how to make your horticultural industry a success. One important part of the business of the propagating establishment is to provide plants and flowers for the decoration of the White House, and for this purpose alone a great space is appropriated under glass—one huge greenhouse being given up exclusively to palms and other tropical and semi-tropical exotics. When the President gives a reception, or on other occasions of festivity, these things and all sorts of other beautiful vegetable products are loaded, in their pots, into great closed express-vans, of the kind used for moving furniture, and conveyed in this way to the Executive Mansion. The east room is transformed into a scene from the tropics, the enormous height of the ceiling giving space for trees of considerable size, lesser ones and plants of smaller growth banking the walls, so that the whole great apartment is a mass of green, festoons of smilax lending delicacy to the effect. As for flowers, it is no unusual thing, when an exceptional jollification is at hand, for the head gardener to send up to the White House a cartload—think of it!—of rose buds. To produce these loveliest of blooms at such a rate, not only are great rose-houses and gardens necessary, but also there is required a most elaborate system, a part of which consists in throwing half the stock of rosebushes away each spring, to make room for new ones. In no case is a rose-plant kept longer than two years after it is planted as a slip, for the reason that the bush always does its best bearing during the first twenty-four months of its existence, when it has its most active vigor. Then the most profitable thing is to chuck it away at the end of its blooming season, to make space for the bush that you have been raising meanwhile from the slip for that purpose. In this way you will get the greatest quantity of blooms for a given number of plants. The entire stock of rosebushes depended upon for a year's supply of blossoms in the Washington gardens is at present arranged on a narrow shelf perhaps eighty feet long, filled with little thumb pots, each of which holds a small but promising slip. Next April those slips will be bushes three feet high, ready to take the place of the two-year-old stock, which will be turned out. Very few people are successful in growing roses, but that is merely because they don't understand the simple principles involved. They want a soil that is half rich loam, a quarter sand, and a fourth part manure. Plenty of light is necessary for them and also plenty of water. But plenty of water does not mean a deluge. Amateurs in gardening usually kill their plants by over-watering; in fact, more plants are destroyed in that way than in all others put together. Watering twice a week ought to be enough for a plant in the house, instead of every day; but the pot that is properly watered can always be distinguished by a slight moisture on the outside—if it is dry, the plant needs a drink. The saucers beneath the pots must be emptied once in every twenty-four hours, else the earth will get sodden and sour. As for bugs, it must not be a question of getting them off the rosebushes; they must never be permitted to get on them. If they get a start, you may as well throw away the plant. You can easily prevent the bugs from coming by applying freely a mixture of strained tobacco solution and whale-oil soap diluted with boiling water. The rose, by the way, is the oldest of all cultivated flowers. The method of manufacturing soil employed by gardeners is rather interesting. To begin with, the loam is obtained from sods cut just two inches deep on fertile land and then permitted to rot, the final result being a rich powdery substance agreeable to feel, pleasant to smell, and full of suggestions of the good things of which it contains the elements. But all plants, like some people, do not thrive on too rich food, and so a portion of sand is usually mixed with the loam. The latter is composed chiefly of vegetable matter, with a greater or less proportion of minerals. Very likely you are aware that soil was originally formed by the disintegration of rock. Scrapings thus made produced certain low forms of vegetable growth, which by their decay added to this beginning of a soil, which was thus enabled to produce forms of vegetation a little higher. These in turn decayed, and thus the soil went on getting deeper and deeper until it could support trees. The function of this horticultural garden is very different from that of the botanic garden here. In the latter is gathered an assemblage of plants that is made as far as possible permanent, propagating being only carried on to the extent necessary for supplying losses. On the other hand, the horticultural garden pretty nearly renews its stock every year, all soft-wooded plants, such as geraniums, coleus and chrysanthemums, being propagated afresh in February for planting out in the parks in May. During the winter great quantities of plentifully-blooming plants, like violets, begonias, pansies and bulbous blossomers, are grown for use in the early spring. Smilax is cultivated all the year round in a manner that is very beautiful to the eye. Hanging close under the roof of one of the greenhouses are wires stretching across horizontally and parallel, a great number of them, extending from one end of the building to the other. From these wires strings are stretched downward to troughs of earth below, by which means the smilax climbs up, thus throwing a succession of lovely green curtains across the house from the roof to the floor almost. Very many plants, such as verbenas, pansies and balsams, are grown from seed by preference. The way to get big pansies is to procure very young plants, keep them moist and near the light, sprinkle the foliage often, and use plenty of manure water that is not too strong. The finest pansy and fuchsia seeds fetch from $75 to $100 an ounce. Always remember to use tepid water on your plants, by the way. One great beauty of Washington is that every street in the town is an avenue of trees, and these are all propagated from seed in the gardens. The flowering shrubs, of which fifteen thousand are produced annually, grow from cuttings.

TELEPATHY.

SOME SINGULAR CASES OF DREAM VERIFICATION.

A case of telepathy was that of the son of Bishop Lee, of Canada. The bishop fell down a flight of stairs in his residence, receiving severe injuries, for which he was afterward treated at Hyde Park, near Chicago. At the instant of the accident his son was asleep in Denver. He sprang out of bed crying: "Father is falling." His wife told him he was dreaming, but he was so impressed that he telegraphed home and learned that his dream, or whatever it was, was a reality. A story with a little romance in it, is that of S. R. W., of Bridgeport, Conn., who was returning from England on an ocean steamer. One night he dreamed that his wife, who was then in Bridgeport, opened the door of his state-room, looked hesitatingly in and then came forward and kissed him. When he awoke in the morning the man who occupied the upper berth in his state-room look'd down and said: "You are a pretty fellow to let a woman come in here in the night and kiss you." Pressed for an explanation, he described the scene which he had experienced. Arrived at home, he was asked by his wife: "Did you receive a visit from me on such a night? I made you one. I was worried because of the reported storms that night. I dreamed I went out on the ocean and came upon a great black steamship. I went up the side and along the corridor and opened your door. I saw a strange man looking at me from an upper berth. I was afraid at first, but finally I stepped in and kissed you."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

May.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, catfish, cod, eels, clams, flounder, halibut, herring, lobster, mackerel, mussels, perch, porgie, rock-fish, salmon, shad, shrimp, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Artichokes, beans, carrots, garlic, lettuce, onions, parsley, parsnip, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

PAN DODDLINGS.—Three cupfuls of Indian meal, three cupfuls of fine rye meal, one egg, three tablespoonfuls of molasses, a little salt and allspice, enough milk to form a stiff batter. Drop with a spoon into boiling lard and fry to a good brown.

MUTTON SOUP.—Cut four pounds of lean mutton into slices and fry them brown, and lay them in their own gravy in a stewpan. Cut into pieces six carrots, six turnips, three onions, two heads of celery with their green tops on, and put them with the meat, adding also two tablespoonfuls of whole black pepper; cover with water and let them boil until the meat is reduced to a pulp; then strain, or serve with the vegetables, seasoning to taste.

SCALLOPED EGGS.—Mince fine some chopped ham and to it put some fine bread crumbs, pepper, salt, and melted butter; moisten this with milk to a soft paste, and half fill small patty pans with the mixture. On the top of each pan break an egg; dust with pepper and salt, and over all sprinkle finely powdered cracker. Set in the oven and bake until the eggs are done.

ROAST LOBSTER.—Half boil a fresh lobster; take it from the kettle, dry with a cloth and rub it over with butter while hot; set it before a good fire, basting with butter. When it produces a fine froth, it is done. Serve with melted butter.

STRAWBERRY CREAM.—Mix together one-half pint of thick cream, one-half pound of powdered sugar, and three gills of strawberry juice (either from the fresh fruit or preserves—but in the latter case use less sugar), and whip up. Serve with blanc mange or puddings.

COOKIES.—Two cupfuls of sugar, one cupful of butter, four eggs, one and a half teaspoonfuls of baking powder, flour to roll out thin and caraway seed or ginger to taste.

FROSTED FRUIT.—Select fine fruit. Currants are very pretty frosted. Beat the whites of a couple of eggs, dip the fruit in them, then in powdered sugar; lay them in a pan lined with white paper, and set in an oven nearly cool to dry. When the icing is firm, pile them on a dish and set in a cool place.

SNAILS.

WHERE THE EDIBLE SPECIES IS COMING FROM.

The other day I was talking to a French *chef* about eating. "Now, tell me, sir, do your guests often ask for snails?" "A Frenchman might, or a Russian, but I never was asked by an Englishman." "Where do edible snails come from?" I asked. "From the vine-growing district of which Rheims is the centre, feeding on the vines and having absorbed a certain vinous flavor, I suppose, which gives them a fatal relish to the epicure. They are placed shell and all in a frying-pan full of butter, the mouth of the shell is stuffed, with herbs, and the result is a delicious morsel which you extract with a two-pronged fork." "A high-class periwinkle! Eh?" "Exactly. These frogs, too, since we are on the byways of cooking, are sometimes required, never by Englishmen, I believe. The edible frog is large, of course; only the legs are eaten, and served up with white sauce, you would not know them from chicken."—*Brit. Confectioner.*

CULINARY HINTS.

SOME COOKERY SUGGESTIONS FROM ENGLISH KITCHENS.

Cardoons, a vegetable little known in England, are nevertheless excellent when cooked. They are stewed first in a white sauce for three or four hours, and, after being strained, are warmed in brown sauce and served with croutons of bread and marrow. Aubergine.—This vegetable is more common in Covent Garden than formerley. It should be stuffed with bread-crumbs, parsley, onions and oil, and is excellent eating. About an ounce of white sugar to two gallons of water is not without its advantage, particularly in winter, when vegetables have less saccharine matter. It renders them more digestable and agreeable. Beets, cut bowl-shaped, instead of into plain slices, and filled with hard boiled white of eggs, and the space usually occupied by the yolk filled with shrimps, look very pretty, and are much used by professional salad makers in the States as a garnish for fish salads. There is nothing so stupid as the vulgar way of putting cabbage on in cold water and letting it boil ad infinitum, as the longer it boils the tougher it becomes. Roe-deer venison is now in many instances almost thrown away as of no pecuniary value or culinary esteem. Yet there is no variety of animal food more nourishing or more readily assimilated. The best parts of this venison could easily be distributed to consumers by parcel post, and, like other venison, it keeps long. Radishes are generally eaten raw, but boiled radishes are not to be despised; boil them fifteen minutes, drain, and serve hot with melted butter or serve cold with sauce vinaigrette. Roasted mussels eaten with salt, pepper, lemon-juice, dandelions and crackers will be found very delicious. Preserved apricots or peaches make a nice easily prepared sweet; the liquor should be boiled with a little sugar and a wineglassful of sherry, or half the quantity of brandy, poured over the fruit when cold, and whipped cream piled on the top. The spatchcock of quails or pigeons which some dragoman serve upon the Nile is understood to be a Greek dish. This spatch-cock is one of the most pleasing breakfast dishes extant, and happily we can give directions. Split the birds, and fry them brown. Put into a saucepan equal quantities of claret and water, a teaspoonful of Harvey's sauce, a tomato, garlic, and a small bag of spices. Let it simmer ten minutes—drop in the bird, and stew slightly.—*The Caterer.*

INVENTORS' DISAPPOINTMENTS.

THE WISDOM OF PLACING AN INVENTION PROMPTLY IN THE MARKET.

A few months ago, says the *Engineer*, an inventor of certain apparatus of a very simple character, which could have been readily duplicated in many different forms, was offered $6,000 for the right to a certain inland town. He was a poor man and needed the money badly. The reader supposes, of course, that the inventor jumped at the chance and pocketed the money on the spot. Not he; he told the buyer that the patent was worth $100,000, and he was not going to sell one town in New York State for $6,000. The same inventor was offered a similar sum for another large town in the State, or $10,000 for only two cities in the country, but he refused to take it. We have these facts from the inventor himself, and they are correct. Before it was too late to negotiate, we berated the man soundly for his folly, but he was deaf to all argument. The sequel was that the inventor never sold a single right, and has his patent to this day. The fatuity of the inventors on this one point, the value of their patents, is wholly incomprehensible from a business point of view. If a farmer was offered $10,000 for ten bushels of potatoes, and refused it upon the ground that the bushels would produce tons of potatoes, he would be no more inconsistent than the inventor who refuses a good round sum of money for an unmarketed invention. Yet this is what they do every day in the year. There are men walking the streets in poverty who have devices of more or less value, which, in the hands of business men, would have commercial value, that they refuse to part with because they are not paid highly enough in their own estimation. Let inventors remember, for their own good, that an undeveloped, unmarketed invention is of no more value than the paper the patent is written on. It has possibilities, no doubt, but these last are intangible, and before they can be converted into dollars and cents another head must be called in, and as his risks are greater than the inventor's, he must have an adequate reward. Every patent of any prospective value, even, has to be litigated sooner or later, and this costs money; its value is not established until the absolute priority of the patent is settled. If inventors would only bear these facts in mind, and sell their inventions as soon as possible, there would be fewer disappointed patentees.

KEROSENE.—Kerosene as a therapeutic agent is highly spoken of by Dr. H. A. Gross in the *Medical World.* It cures almost all pains, from toothache to gout and rheumatism. It is deodorized in this manner: Take of coal oil, 1 pint; nitric acid, 1 ounce. Mix. Let it stand for a week and pour off the supernatant oil. It does not in the least smell like coal oil.

LACK OF SYMMETRY IN THE EYES.—When the average man or woman comes to be fitted with the first pair of glasses, some curious discoveries are made. Seven out of ten have stronger sight in one eye than the other. In two cases out of five, one eye is out of line. Nearly one-half the people are color blind to some extent, and only one pair of eyes out of every fifteen are all right in all respects.

THE CIRCULATION OF THE BLOOD.

In the human body a hydraulic system for the distribution of nutritive material is introduced. A fluid is distributed in a ceaseless flow all over the body by a mechanical arrangement consisting of a pump with branching tubes, worked on mechanical principles, and capable of being imitated artificially, save that the power which drives the machine is the energy set free by living muscle. As this circulating fluid, or blood, rushes past the endoderm cells, which have gorged themselves from the rich contents of the alimentary canal, it receives from them some of the material which they have absorbed and elaborated, and carries this nutritive supply to muscles, nerves and all parts of the body. Similarly it carries away from muscles, nerves and other tissues the waste products of their activity, those broken fragments of simpler stuffs into which the complex protoplasm, wherever it exists, is forever splitting up, and bears them back to differentiated endoderm and other cells, whose work has become, so to speak, inverted, since their activity is directed to casting things out of the body, instead of receiving things into the body; and, lastly, by a special arrangement, by a peculiar property of those red corpuscles which make blood red, this circulating material at one and the same time carries to each corner of the body, not only the nutritive material required for building up protoplasm, but also the oxygen by which the constructed protoplasm may suffer oxidation, and in being oxidized set free that energy the manifestation of which is the token of life. Blood is, in fact, the medium on which all the various parts of the body live. Just as an amœba finds in the water which is its home both the food with which it builds itself up and the oxygen with which it breaks itself down, and returns to the water the waste products of its continued disintegration, so each islet of the living substances of the higher animal, be it muscle, or nerve, or gland, draws its food and its oxygen from the red blood-stream sweeping past it, finding therein all its needs, and sheds into the same stream the particles into which it is continually breaking up, and for which it has no longer any use. Hence the blood becomes, as it were, a chemical epitome of the body; from it each tissue takes something away; to it each tissues gives something back. As it sweeps by each tissue, losing and gaining, it makes the whole body common, and when working aright brings it about that each tissue is never in lack of the things which it wants, never choked up with the things with which it has done. This vascular system consisting of a force-pump and branching tubes, constitutes, as we have said, a mechanical arrangement worked on mechanical principles. Nevertheless occult protoplasmic processes intervene as factors in its total work. Not only is the force-pump itself a living muscular organ, not only are the walls of the tubes muscular in nature, so that the mere mechanical working of the system is modified by changes not of mechanical origin taking place in them, but the living material which lines the tubing throughout, especially in the minuter channels, finds work to do, also not of a mechanical nature. The gross phenomena of the flow of blood through the capillary channels may be interpreted on simple hydraulic principles; but no appeal to the ordinary physical laws of dead material will explain the phenomena of the interchange between the blood on the inside of a capillary wall and the tissue-elements on the outside. In every tissue, be it gland, muscle, or nerve, the blood so far from being actually in contact with the active protoplasmic units of the tissue, is separated by the protoplasmic film of the capillary wall, and by a space or spaces, greater or smaller, filled with the fluid called lymph and lined to a greater or less extent with protoplasmic cells, which lining, often at least parts the tissue units from the lymph. Hence the tissue lives upon the lymph. While the lymph is replenished from the blood, and the interchange between the tissue unit and the blood is determined, not only by the direct action of the tissue unit on the lymph, but also by the relations of the lymph to the blood, as regu-

lated by the capillary wall and the cellular lining of the lymph spaces. We may speak of the interchange as broadly one of diffusion or osmosis through filmy membranes, but diffusion is not the lord in the matter; it is rather a humble servant directed hither and thither by occult molecular processes in the protoplasmic structures concerned. The lesson to be learned from this is obvious. If a chemical agent, so prepared as to be readily taken up by the blood, is placed where the blood can reach it, the consequence will be that the blood will carry it through the system, to dissolve, absorb and take up effete and diseased matter and to leave behind in its stead the necessary vitalizing salts. Such an agent is Dr. J. C. Ayers' Sarsaparilla, and though everybody may not be quite able to understand the intricacies of physiology they may rest assured that it is done as thousands of cases in years of experience have abundantly shown.

BUSINESS NOTES.

A PHOTOGRAPHIC NOVELTY.

Rapid as has been the progress in all branches of photography, the problem of seizing and reproducing the varied colors of nature seems as from solution as ever. That achievement is still the dream of the ambitious photographer, and some day perhaps chemistry may help the experimenter with her subtle secrets to make the dream a reality. Apart from this supreme problem, however, photography is making daily extraordinary advances. The art to-day is unlike that of yesterday, and what it may be to-morrow no one can predict. The cumbersome methods of the past have been abolished; keener sensitive surfaces have been discovered; the dry glass plate has driven out of the field the old wet process, and other improvements are making still easier and more delightful the work of the photographic amateur. The latest novelty—and a charming one it is—is the Kodak camera, brought out by the Eastman Company of Rochester, N. Y. This consists of a small oblong box no longer than an ordinary cigar box. A roll of prepared paper stands behind the lens, which is covered by a revolving shutter. The box is presented to the object to be photographed; a little stud is pressed with the forefiger of the left hand; snap goes the shutter; the exposure has been made, and a turn of the handle on the top of the box brings a fresh portion of the roll behind the lens ready for the next picture. The roll is large enough for a hundred pictures, and a child can manipulate it. The pictures thus taken are necessarily small, but they are perfect little gems. So sensitive is the prepared surface, that although the exposure is only the fraction of a second, the amount of detail in the picture and the clearness and sharpness with which it comes out is amazing. For broad landscape effects the Kodak, is, of course, not intended. Its strongest point is in reproducing those choice bits of nature which abound in every locality. A quaint, picturesque cottage with its vine-clad porch and clump of sugar maples; a quiet turn in the brook, with perhaps an old willow bending over it, or a group of silver birches brightening up the rising bank; a bold, jutting piece of rock; the village church; the blacksmith's shop with horses waiting to be shod; the country schoolhouse with its inmates just let loose—these are a few of the things which the Kodak turns into pictures of beauty and a joy forever. For the tourist or the overworked business man spending a few weeks' vacation in the country, the Kodak, when known, will be indispensable. It takes up little room and can be carried in a small satchel slung over the shoulder, and is always ready for use.—*New York Tribune, Dec.* 12, 1888.

THOSE CHICAGO LADIES

Who attended Professor Pfau's COOKING CLASSES during the past winter, formed a very favorable impression of his culinary knowledge and skill, and no doubt profited by his instructions. It is interesting, therefore, to know what the Professor thinks of ARMOUR'S EXTRACT OF BEEF. He writes us as follows, under date March 24, 1890: "I used your extract during my last Course of Cooking. There is no better in the market, in regard to strength and flavor, and I cheerfully recommend the same to all families who wish to make rich soups and sauces. It is much cheaper than the meat stock and always ready." The life and flavor of the beef are retained by our process and not burned out. ARMOUR & Co., Chicago.

MELLIN'S FOOD.

Mellin's Food is a soluble preparation, containing proper proportions of those nitrogenous and phosphatic matters which are essential for the healthy growth of a child, but are not easily obtained in prepared foods as usually sold. It is not only readily digestible itself, but

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CONTENTS.

COST AND PRODUCTIVENESS OF LABOR.

The U. S. Commissioner of Labor is preparing to transmit to Congress his first report on the cost of production. The Commissioner has been engaged on the report for several months and has obtained some very interesting and valuable material. The purpose is to ascertain all the elements that enter into the cost of production of a manufactured article, and Congress extended the inquiry to foreign countries in order to obtain facts bearing upon the tariff question. The Commissioner's report will embody data that have never been presented in any official report in any country. It will undertake to give with precision not only the elements of cost in the production of an article, but the efficiency of labor in different countries and in different lines of industry and the relations between efficiency, wages and manner of living. The labor will be reduced to the hour basis, and it will be possible to determine, by an examination of the tables, the precise relation between wages in the United States and European countries, and the relation between the work performed in each country for those wages. The cost of management, the cost of repairs, the interest on invested capital, will all be set forth with a fullness which will admit of the most searching comparisons. Where a product is composed of more than one material, each of the raw materials will be followed to its source and the cost of producing it set forth. The report on iron and steel will be sent to Congress within a few weeks, and those on cotton and wool will follow soon after. The other reports upon which the Commissioner is at work are on glass, linen, silk and lumber. These facts will be of use from a theoretical standpoint and in tariff and industrial discussions. They are so full and precise that they are likely to have a still further use for the practical business man. By comparing the statements for different establishments he can learn what others in his line of business are spending for the different elements that enter into their products and can correct his own methods by the study of those of others. The hours of labor, the wages paid, the cost of raw material, the cost of subsidiary materials, the cost of management will all be set forth and can be studied by the intelligent business man.

HONEST LEGISLATION FOR HONEST GOODS.

In the United States Senate, on April 29th, the Committee on Agriculture had under consideration a bill to provide penalties for dealing in adulterated or impure food. No action was taken, but an effort is being made to secure from the committee a general bill on the subject which will be ordered reported to the Senate. If such a bill can be wisely framed, it will be a great boon to both the consumer and the honest manufacturer. To meet the requirements of the situation honestly, however, it should include in its scope all varieties of "compound" foods, with some inflexible provision for informing the purchaser of the latter as to the ingredients of which they are compounded. In this way the impending evil of having such commodities as compound lard subjected to the imposition of a special tax in the manner of the iniquitous oleomargarine law would be effectually obviated. This subject was ably discussed at considerable length lately by the *Commercial Bulletin* of this city, which first propounds and then answers the question whether compound foods, as such, ought to be taxed—a question which, says our contemporary, has never been fairly brought forward nor squarely faced. It has, however, been answered, by implication, in the affirmative in the oleomargarine legislation, and the Compound Lard bill now before Congress reaffirms the principle. The possibilities lying in the direction of further legislation on similar lines are so great as to warrant an endeavor to clearly distinguish just now between such bills as the Compound Lard bill and pure food legislation. No bill yet framed in the latter direction, either in this country or abroad, has refused to recognize the existence of compound foods as legitimate productions within certain limits, these being the requirements that they shall be wholesome, nutritious articles of diet. Provided they are that, and are sold on their own merits as compound articles, there is no good reason for any other course of action with regard to them. Under their own names they are not adulterated articles, but only become such when passed off upon the public under the name of some one or other simple production. When oleomargarine is labeled and sold as such the buyer is not deceived, nor is he injured, the article being admittedly wholesome. When, however, it is sold as butter a fraud is perpetrated. It is a proper function of the law to suppress such frauds and punish the offend rs. It is quite another matter, however, to say that such an article of diet having the recommendation of cheapness, and free from the charge of unwholesomeness, shall not come into the market on equal terms with another article against which it competes, provided always that the competition is clearly defined by specific nomenclature. In reference to compound lard, the *Bulletin* takes the same ground as that which the AMERICAN ANALYST has occupied throughout the controversy in declaring that, so far from its being injurious to consumers, the weight of evidence is in favor of it being as wholesome and nutritious as hog lard. Sold as pure lard it is undoubtedly an adulterated imitation, and the provisions of the bill penalizing it in this connection cannot be objected to. But that is no reason why it should not be sold for what it really is just as freely as it can find buyers. Such competition with pure lard would be quite fair. To forbid that, either by direct prohibition or prohibitory taxation, is to advance a prescriptive right on behalf of pure lard refiners to all the food uses into which lard, either pure or compound, enters. No such rights do or can exist. If cotton-seed oil can be made useful in the same direction as hog fat, by improved processes of refining, it is legislation of the most individious character to champion the hog against cotton-seed. We are constantly discovering new uses for both animal and vegetable products, and it is difficult to say where class legislation on such a basis may land us, as these discoveries come into competition with present uses. It is the bane of much of our present law-making that general principles are ignored altogether, or, what is just as bad, the consideration of them is shirked by our legislators.

ONE SECRET OF SUCCESS.

A frequent mistake made by the proprietor of a new and meritorious business is that of imagining that the public will become interested in it without advertising. If it is advertised at all, it is assumed that a single insertion at the lowest rates will cause the public to make a rush with orders. Here is a grave mistake. When you wish to advertise, do so systematically. Take the utmost care in preparing copy, but follow it up from week to week without faltering. An advertisement that catches the eye of a reader a dozen times is apt to

begin to attract attention. He at last reads it with care, and is surprised that the thing he wants has been so long within his grasp. You must convince people you are in dead earnest if you want to succeed in business. Never fancy that dollars are going to rattle into your treasury if you hoard them like a miser. If you expect other people to be generous, show that you have the same quality in your own nature. A one-time advertisement is like a soap-bubble; it may be pretty, it may be attractive, but it quickly bursts, and no one has found out who blew it. Keep your bubbles flying until their source is discovered. Thousands fail in first-class business enterprises because they fail to see that they are the only parties cognizant of the existence of their valuable commodities. Advertise first, last and all the time.

SCIENCE AND HAMADRYADS.

The dividing line between vegetable and animal life is sometimes hard to distinguish, but the difference between average intelligence and scientific knowledge is easily enough detected. An illustration is offered in the following sapient extract from a recent letter to the Boston *Transcript:* "What are you going to designate as the point which distinguishes animal from vegetable? Locomotion has been suggested, but that is no test. Certain small seaweeds have power of locomotion, while, on the other hand, the animal creature known as the ant's cow, from which that ingenious insect obtains its supply of milk, cannot move a particle. The more deeply science dips into the subject the more inevitable does the conclusion become that life in the animal and the plant is precisely the same thing and that vegetables possess in the fibres of their roots the same sort of intelligence that yourself and other human beings have in their brains. How do these root fibres know precisely which way to look for water. Plant instinct, perhaps, you will say. But instinct is only a vulgar term for inherited experience, which in itself implies consciousness. Oh, yes, vegetables have minds; at all events scientific men have pretty generally come to that conclusion."

AMERICAN MEAT ABROAD.

It is announced from Washington that the House Committee on Agriculture has agreed to report favorably the bill now pending before the Senate for the inspection of cured meats for export, with the modifications asked for by the packers of Chicago. The question has been already discussed, but without any result, on account of a disagreement in regard to the place of inspection, some wanting the meats examined in the States where they are packed, and others claiming that they should be examined at the port of shipment. If a system could be adopted which European Governments would accept as satisfactory, they would repeal the restricting and almost prohibitive decrees actually in force against the importation of American meats in most European countries. The popular classes there need American pork, mutton and beef to make up for the deficiency in their meat production. They clamor for it still louder now, since the experiments for the importation of frozen meats from South America have proved a failure, as shown by the financially unsuccessful trips made between Havre and Buenos Ayres by the vessels especially equipped for this trade. Similar experiments made for the transportation of mutton from Australia and New Zealand to Great Britain have had better success; but those concern only the latter country and only relate to mutton, while continental Europe wants American pork and beef. It is more than likely that if a good inspection law was adopted by Congress it would prove the best practical step to convince the French Government of the soundness of American meats, and of the necessity of readmitting them, in the interest of the French laboring classes.

NOT CANNED BUT DECAYED.

During the last week several families in Tottenville have been compelled to call in physicians to attend some of their number who had been taken suddenly sick. The symptoms in each case were strikingly alike, the patient being attacked with violent vomiting and exhibiting other symptoms of poisoning. The attending physicians were at first puzzled, but finally diagnosed the cases as poisoning. They learned that in each case the patient had eaten canned corned beef, which had been purchased at the village grocery. Dr. George Hubbell, who attended most of the cases, said yesterday that he had made an analysis of the meat which the patients had eaten and found it was in such a condition as to be unfit for food. He believed that the beef had been poisoned by being cooked or prepared in a copper boiler. All the persons who became ill from eating the bad beef have recovered or are on the road to recovery.

The usual sensational headline "Poisoned by eating canned corned beef," attracted our attention to the above paragraph in the daily papers. Upon addressing the attending physician, Dr. Hubbell, he favored us with a specimen of the corned beef which had caused the trouble and which he informed us was not canned but was corned, cured and boiled by a local butcher. The application of Trotarelli's test absolutely proves that the cause of the poisoning was ptomaines, a product of decomposition. Thus another unjust aspersion upon canned beef is disproved.

DRUGS IN CONGRESS.

TEXT OF A BILL INTRODUCED IN THE HOUSE OF REPRESENTATIVES APRIL 7, 1890, BY MR. BOATNER, OF LA.

For the prevention of adulteration and misbranding of drugs, and for the prevention of poisonous or injurious adulterations, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the introduction, for purposes of sale, barter, or exchange into any State or Territory from any other State or Territory, or foreign country, of any article of food or drugs which is adulterated within the meaning of this act, is hereby prohibited, and any person who shall willfully and knowingly ship or deliver for shipment from any State or Territory or foreign country to any other State or Territory, or who shall knowingly receive in any State or Territory from any other State or Territory or foreign country, or who, having so received, shall deliver, for pay or otherwise, or offer to deliver to any other person, any such article so adulterated within the meaning of this act, shall be guilty of a misdemeanor, and for such offense be fined not exceeding two hundred dollars for the first offense, and for each subsequent offense not exceeding five hundred dollars, or be imprisoned not exceeding one year, or both, in the discretion of the court.

SEC. 2. That any person who shall knowingly ship or deliver for shipment from any State or Territory to any other State or Territory or foreign country, or who shall knowingly receive in any State or Territory, or who, having so received, shall deliver, for pay or otherwise, or offer to deliver to any other person, any compound article of food or compounded drug which is not accompanied by the label, brand, or tag as hereinafter provided, shall be guilty of a misdemeanor, and for such offense be fined not exceeding two hundred dollars for the first offense, and for each subsequent offense not to exceed five hundred dollars, or be imprisoned not to exceed one year, or both, in the discretion of the court: *Provided,* That in case of articles of food or drugs manufactured for export it shall be lawful to use such brands or labels as may be distinctive or descriptive of the article, although such brands or labels do not contain the words "mixture" or "compound."

SEC. 3. That any person who shall willfully apply to any compound article of food or compounded drug a label, brand, or tag, or order or permit another person to apply the same, for the purpose of allowing the said article or drug to be introduced into any State or Territory, or for the purpose of export to a foreign country, which label, brand, or tag shall falsely describe said article or drug in any of the particulars called for by this act shall be guilty of a misdemeanor and, on conviction, be fined not to exceed three hundred dollars.

SEC 4. That the term "food," as used in this act, shall include every article used for food or drink by man other than drugs or waters. The term "drug" as used in this act shall include all medicines for internal or external use.

SEC. 5. That for the purposes of this act an article shall be deemed to be adulterated—

In the case of drugs:

First. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity, according to the tests laid down therein.

Second. If, when sold under or by a name not recognized in the United States Pharmacpœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity, according to the tests laid down in said work.

Third. If its strength or purity fall below the professed standard under which it is sold.

In the case of food or drink:

First. If any substance or substances has or have been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength, so that such product, when offered for sale, shall be calculated and shall tend to deceive the purchaser.

Second. If any inferior substance or substances has or have been substituted wholly or in part for the article, so that the product, when sold, shall be calculated and shall tend to deceive the purchaser.

Third. If any valuable constituent of the article has been wholly or in part abstracted, so that the product, when sold, shall be calculated and shall tend to deceive the purchaser.

Fourth. If it be an imitation of and sold under the specific name of another article.

Fifth. If it be mixed, colored, powdered, or stained in a manner whereby damage is concealed, so that such product, when sold, shall be calculated to deceive the purchaser.

Sixth. If it contain any added poisonous ingredients or any ingredient which may render such article injurious to the health of the person consuming it.

Seventh. If it consist of the whole or any part of a diseased, filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, of an animal that has died otherwise than by slaughter: *Provided,* That an article of food or drug which does not contain any added poisonous or injurious ingredient shall not be deemed to be adulterated in the following cases: First, in the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names, and not included in definition fourth of this section; second, in the case of articles labeled, branded, or tagged so as to plainly indicate that they are mixtures, compounds, combinations, or blends, and which do not violate the provisions of subdivisions sixth or seventh of this section; third, when any matter or ingredient has been added to the food or drug because the same is required for the production or preparation thereof as an article of commerce in a state fit for carriage or consumption, and not fraudently to increase the bulk, weight, or measure of the food or drug or conceal the inferior quality thereof; fourth, where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation; fifth, in the cases prescribed and exempted in and by section thirty-four hundred and thirty-six of the Revised Statutes of the United States.

SEC. 6. That no person shall be convicted under the provisions of this act if he shows to the satisfaction of

the court before whom he is charged that he did not know that the article of food or drug was adultered within the meaning of this act and that he could not with reasonable diligence have obtained that knowledge.

SEC. 7. That any article of food or drug which shall be imported into the United States contrary to law shall be forfeited to the United States, and shall be proceeded against under the provisions of chapter eighteen of title thirteen of the Revised Statutes of the United States, and such imported property so declared forfeited may be destroyed or returned to the importer for exportation from the United States, after the payment of all costs and expenses, under such regulations as the Secretary of the Treasury may prescribe; and the Secretary of the Treasury may cause such imported articles to be inspected or examined, in order to ascertain whether the same have been so unlawfully imported.

SEC. 8. That it shall be the duty of the several United States district attorneys to prosecute all violations of this act which shall be brought to their knowledge in the same manner as other offenses against the United States are prosecuted.

SEC. 9. That nothing in this act shall be construed as modifying or repealing the provisions of chapter eight hundred and forty of the acts of the first session of the Forty-ninth Congress, entitled "An act defining butter; also imposing a tax upon and regulating the manufacture, sale, importation, and exportation of oleomargarine," approved August sixth, eighteen hundred and eighty-six.

SEC. 10. That whenever the President of the United States shall be satisfied that there is good reason to believe that any importation is being made, or is about to be made, into the United States from any foreign country of any article of food or drug that is adulterated within the meaning of this act, he may issue his proclamation prohibiting the importation of such article.

SEC. 11. That whenever the President of the United States shall be satisfied that unjust discrimination is made by or under the authority of any foreign Government against any product of the United States, he may direct that any or all products of such foreign Government so discriminating against any product of the United States shall be excluded from importation into the United States, and in such case he shall make proclamation of his direction in the premises and therein name the time when such proclamation against importation shall take effect, and after such date the importation of the articles named in such proclamation shall be unlawful. The President may, at any time, revoke, modify, terminate, or renew any such proclamation as in his opinion the public interest may require.

SEC. 12. That this act shall take effect ninety days after its passage.

TRAVELERS' RIGHTS.

THE LIABILITY TO PASSENGERS OF SLEEPING CAR COMPANIES.

There has been much litigation of late years on the subject of the liability of parlor-car and sleeping-car companies for the loss of property by their passengers. Decisions have been various and inconsistent. A few years ago an Eastern or Southern court decided that sleeping-cars where neither common carriers nor hotels, and, therefore, that the loss of property on such cars was not to be decided by either common carrier or hotel law. In another case, a lady left her satchel on the sill of an open window in a parlor-car while she went into a dining-room at a station, and her satchel was stolen during her absence. As any passer-by on the station platform could have carried her satchel away, its loss was held to be the result of her own negligence, which relieved the parlor-car company from responsibility. In another case a satchel containing valuable property was carried away from a berth in a sleeping-car, where, with the property and effects of other passengers, it was in charge of the company's employes. In that case the company was held to liability. A recent case in Nebraska has been decided by the Supreme Court of that State, and the doctrine announced will probably become the settled law of the country on the subject. The Court holds that the passenger is the guest of the sleeping-car company, as a man is a guest at an inn where he stops and that he necessarily must take his ordinary wearing apparel with him, and some articles for convenience, comfort or necessity. As the liability of innkeepers is imposed from consideration of public policy as a means of protecting travelers against the negligence and dishonest practices of the innkeeper and his servants, the liability of sleeping-car companies rests on similar considerations. A sleeping-car is simply a lodging house on wheels. A parlor-car is simply a movable hotel reception room. The proprietors of the cars should be held to the same accountability as the other class.

SCIENCE AND SICKNESS.

THE RELATION OF CHEMISTRY TO MEDICINE.

While medicine is one of the oldest of sciences, as is shown by the trepanned skulls found among the relics of the pre-historic races of Europe, chemistry is one of the youngest; and although the alchemists, in their fanciful search after impossibilities, stumbled upon many valuable discoveries, and recorded observations which afterwards proved to be of great importance, yet not until the time of Lavoisier can there be said to have been any real system of chemical philosophy, and the science of chemistry, as now accepted, is almost entirely a growth of the present century. Coincidentally with the advance of chemical knowledge, the science of materia médica began to be founded upon a more rational basis, and the disgusting and useless mixtures with which the doctors of the preceding centuries had afflicted their doubly unfortunate patients, began to give way to the substances, both organic and inorganic, prepared by the chemists, of which the composition was accurately known, and the therapeutic action invariable—except so far as limited by individual peculiarities of constitution. Like all good things, the new remedies were subject to many abuses. The powerful action of mercurial compounds, still invaluable in many cases, led, at first, to a wholesale use of them for all manner of diseases; and the injury which they sometimes caused has brought about not only a general popular horror of all mercurial compounds, but one which has included all the inorganic, or "mineral" remedies—a prejudice which is fully understood and taken advantage of by the quacks, who advertise their "purely vegetable" cure-alls, regardless of the fact that some of the most dangerous and deadly poisons known belong to the class of organic substances. Among the remedies which the physician owes to the chemist, are the invaluable quinine, morphine, strychnine, caffeine, and a large number of other alkaloids; the bromides, the iodides, chloral hydrate, the various acids and salts of phosphorous, the salts of iron, and, perhaps, the most valuable of all, the anæsthetics—ether, chloroform and nitrous oxide. The modern practice of antiseptic surgery would have been impossible if the chemist had not first produced the germ-destroying substances, such as corrosive sublimate, carbolic acid, permanganate of potash, thymol, and others of a list which is increasing in length daily. Many—perhaps the majority—of these compounds were accidentally or purposely prepared by investigators who were interested only in their chemical relations, and had no thought whatever of the medicinal value which they afterwards proved to possess, and which, in fact, it would have been impossible to foresee or predict. This fact is well illustrated by the substance now extensively used in medicine known as antifebrin or acetanilid ($C_6 H_5 NHC_2 H_3 O$). This body has been known for a long time, and some fifteen years ago we prepared a small quantity of it, as an intermediate product in the synthesis of an organic compound of theoretical interest only. This was probably the first specimen ever prepared in this country, although, of course, it was previously well known to chemists; but it was not until many years afterwards that its remarkable antipyretic action was discovered, and it is now found in every drug store. As to the more lately discovered remedies which have been introduced to the medical profession by the chemist—such as somnal, urethan, salol, sulphonal, phenacetine, exalgine, antipyrine, and numerous others—it may be said that, while they all doubtless have more or less value, much observation and experiment will be necessary to determine their exact therapeutical action. This can in no way be predicted from their chemical composition, and the use of any new remedy must be more or less empirical until its medicinal qualities are fully understood. Take calomel and corrosive sublimate, for instance; chemically they are almost identical, but while one is extensively used as a medicine the other is one of the most powerful poisons known; and there are numerous organic compounds, which, although they give identical results when analyzed, yet in their physical and medicinal properties are as widely different as it is possible for any two substances to be. The increasing attention paid to the study of chemistry in medical schools is, therefore, a tendency in the right direction. Although, as has been said above, the therapeutic action of a substance is not dependent upon its chemical composition, yet it is of the utmost importance that the physician should be, to some extent, a chemist. If there were no other reason, it would be necessary to prevent the prescribing of incompatible substances in the same mixture. The prescription files of most druggists, if they could be examined, would show ludicrous instances of the lack of chemical knowledge by physicians of high standing. But, aside from this, the tendency is to discard the old-fashioned bulky drugs, and use instead their active principles which the chemist separates out and condenses in compact form; he is also constantly making and offering to the profession new combinations of the four elements which make up the endless list of organic compounds. Although there may be an occasional relapse to mediæval agents—as in the recent pyrotechnic announcement of Dr. Brown-Sequard—yet it is the chemist who is to discover our future remedies, and the physician with the most thorough knowledge of chemistry who is to apply them intelligently and use them successfully.—*Popular Science News.*

CRYSTALLOGRAPHY.—If sodium sulphate be allowed to crystallize (*New Idea*) between plates of unglazed procelain in the open air, and if the crystallization be reproduced two or three times by sprinkling with water, the plates fall to powder. The same phenomenon is observed with very hard stones. This crystallization may be the cause of the comminution of rocks which resist water.

HEAD AND BRAIN.—Dr. Starr, of London, says that it is impossible to draw any conclusion from the size or shape of the head as to the extent or surface of the brain, and so as to the mental capacity. It is absurd to judge of the brain surface by either the size of the head or the extent of the superficial irregular surface which is covered by the skull, without taking into consideration the number of folds or the depth of creases. "For a little brain with many deep folds may really, when spread out, have a larger surface than a large brain with few shallow folds." What do phrenologists say to this?

WEIGHTING SILK.—The process of weighting silk by tin salts has been recently described, but this is from another source: The bichloride is reduced by water to 30 deg. B., which is the strongest solution that can be employed with safety, stronger would be likely to injure the fibre; at 34 deg. B. the silk becomes rough and valueless, at 40 deg. B. the fiber is dissolved. The silk is well worked in the solution until perfectly saturated, left two hours in the liquor, taken out and washed. One dip adds about eight per cent. to the weight, three treatments give an increase of about 25 per cent. Bare hands must not be used in working the goods in bichloride of tin at 30 deg. B.; it acts injuriously upon the skin from its strong acidity. The silk must be very well washed before it is soaped; any of the tin solution left in it would decompose the soap.—*O'Neil.*

CONDENSED MILK.

ITS HISTORY, MANUFACTURE AND BENEFIT.

The demand for condensed milk grew out of a desire to render milk capable of being transported long distances and to keep it sweet for a long time. The process of condensing is simply evaporation—by means, however, of a vacuum pan. In the middle of this century Professor E. N. Horsford made numerous experiments showing that milk could be successfully condensed by evaporating it at a low temperature with the addition of some sugar. He did not employ a vacuum pan, but he pointed out the means by which his assistant, Dalson, with Blatchford and Harris, succeeded in placing the first condensed milk upon the market. This milk, which was sold in cakes packed in tin foil, formed part of the provisions which Dr. Kane took with him on his polar expedition. In 1856 Blatchford improved the process by introducing the vacuum pan. In the same year Gail Borden obtained a patent for applying the vacuum pan in a particular way to the preparation of condensed milk without the addition of sugar or other foreign substance. This milk, however, would not keep for any length of time, and Borden added sugar, and his preserved milk appeared on the market in tin boxes, hermetically sealed. Horsford and Borden share the honor of having invented condensed milk. Condensed milk is prepared by evaporating ordinary milk at a temperature below 100 deg. C.; preserved milk is condensed milk to which sugar has been added during the process of evaporation. The ordinary condensed milk of commerce is simply condensed milk to which cane sugar has been added. They found that in the condensing, after the milk reached a boiling point, the fat separated from the rest and a proper degree of thickness could not be obtained, but that by adding cane sugar the milk could be reduced to the desired consistency. If the milk were thin enough to shake around in the can it would be churned, as it were, by handling, and little lumps of butter would gather in it. Then there is another kind of condensed milk that milkmen sometimes carry around in bulk, in ten quart cans, a kind of condensed milk made without sugar, and that will keep several days. That kind is the best in the world for babies brought up by hand. This fallacy about "one cow's milk for the baby" is pretty well knocked out now. People, in the first place, are not sure that they are getting one cow's milk, and the next place, if they are and the cow is diseased, the baby's health is endangered. The milk of a whole herd is more uniform, and the process of condensing will remove or destroy any injurious ingredients or taints that might have been in the milk before it was boiled. This kind of condensed milk is the best for coffee, also, as it will not dilute and weaken the coffee, as common milk will. Sometimes this condensed milk (without sugar), when purchased from wagons, has a curdled appearance when stirred in coffee. This is generally due to the milk not being fresh, and having two days condensing mixed in the can. Our German friends have gone one step further in the direction of condensing milk. As was published in the last number of the AMERICAN ANALYST, they have succeeded in producing a milk powder composed only of the milk solids, and which it is claimed they can change into milk again by the addition of water. This we doubt.

CARVING.

SOME POINTS WHICH EVERY HEAD OF A FAMILY SHOULD KNOW.

A gentleman should not only know something about sauces, but also the proper way to carve different kinds of meats, game and poultry. Nowadays too many hosts are obliged when they entertain, to appeal to some one of their guests for assistance in carving, something that may be annoying to the former and certainly is troublesome for the latter. The first thing to be seen to by those who wish to carve well is that they have the right kinds and sizes of forks and carving knives, and there must be a set for each kind of meat, fish, fowl and game. The knives should be kept well sharpened, an easy thing if they are passed every day over a whetstone, and the forks should be of steel, strong and well pointed. In order to carve well it is necessary to stand up, and as the pieces are cut off they should all be placed collectively in a single dish to be handed round the table so that each person may select the slice that he or she prefers.

"Any one can serve fish," of course, but how does it look when pulled to pieces? To serve a trout, mark with a fish knife a line starting at the head and extending within two inches of the tail, and then draw other lines starting from this one and running to the sides of the fish. A salmon is served in the same way as a trout, while blue fish should be divided into two parts longitudinally; then remove the large bone and cut the fish in pieces into such a way as to give each guest a portion of back and belly. The head of a pike should be offered to a lady. Barbels are served in the same way as trout, and chub the same as pike. Nearly every man you meet carves a leg of mutton badly, and yet its tenderness almost always depends on the way the slices are cut off. There are two ways of doing this. When you are sure that the leg is from a sheep of a good breed and that it is really tender, take hold of it by the knuckle with the left hand and then cut the slices perpendicularly from the joint to the bone of the filet; then remove the muscle of the knuckle, next turn the leg over and slice off the back portion. For this essentially primitive way of carving gourmets substitute carving by curvilinear slices, which renders the pieces more succulent. But neither of the ways of carving a leg of mutton should be resorted to except when the meat is of the best quality and of great tenderness. In other cases the best way to proceed is to cut horizontally instead of perpendicularly—that is, cut off the slices parallel with the bone; the slices should be cut very thin, and when a sufficient number have been sliced off you should plunge the fork into what remains of the leg several times and let the gravy run over them. A few drops of lemon juice and a little pepper and salt added will improve the flavor amazingly. Americans have much to learn about cooking game. The wild duck is not always a tender bird and it can be made tolerably tough in the kitchen. A canvas-back duck should never be cooked less than fifteen nor more than eighteen minutes, and then in a very hot oven. It should be carved in slices, and in cutting, the wings and thighs are sacrificed. Most wild ducks should be served so underdone that the blood will run when they are sliced up; the juice of two lemons may be squeezed into their blood; also add a few drops of oil, a little salt and some pepper, after which let the slices soak for a minute in the gravy thus prepared before handing them round. In the case of teal duck there is no need of cutting off the legs and wings. A woodcock should not be drawn; what drops from it when cooking should be caught on a toasted piece of bread on which the bird is to be served, seasoned with pepper, salt and lemon juice. In carving, first remove the wings and legs; then divide the body lengthwise. The wing is the most delicate morsel, but the thighs have more flavor. Do not throw away the carcass or bones unless you wish to commit high culinary treason. Mashed in a mortar they will form a puree that will give an excellent flavor to a black gravy which you ought to serve with the bird. French gourmets inclose the head of this bird in a coating of tallow, broil it over a candle flame and then eat it. It is only a mouthful, but it is a divine morsel. Snipe should be cut in two longitudinally. To carve a partridge, first remove the right wing and leg, then those on the left side and next divide the body in two lengthways. Only young partridges should be roasted; the older birds are better made up in salamis or stews. Quail is served rolled in a thin slice of bacon and inclosed in a grape leaf. It is also cut in two, like real reed and rail birds, and larks may be treated in the same way. The thrush is cooked like the quail, but it may be carved either limb by limb, or cut in two lengthways. The first turkey-cock ever seen in France was served up on the 26th of November, 1570, on the occasion of the marriage of Charles IX. and Elizabeth of Austria. There are more ways than one of carving a turkey. One way is to cut from the breast square slices, and proceed in the same way for all the fleshy parts of the bird. Though this is an easy way for the carver, it has the drawback of allowing all the natural gravy to escape and leave the most delicate morsels clinging to the carcass. Or you may remove the legs separately, place them to one side, and then do the same for the wings, but cut them up in pieces of suitable size; next cut off the white meat as close to the carcass as possible, and lastly break up the carcass. A third way, after the wings have been removed, is to break the carcass above the crupper, which remains attached to the legs and forms a sort of hood, vulgarly called the "bishop's cup." This is a good way to serve. Carve when there are only a few persons at the table; if the guests are numerous the second way is the better one. Chickens and capons are carved very much the same way as turkeys. The legs make two pieces, the wings three, the white meat is left in whole slices, and the carcass is separated into six pieces. Chickens and capons are much improved by the use of truffles, but truffles cannot be got in America. Moliere owed the title of one of his master-pieces to truffles. He was dining at Chantilly with the Prince de Conde and the secretary of the Papal Nuncio, a purple-faced, red-nosed monk, who never opened his mouth except to stuff food into it. The only thing he said during the repast was when the second course came on, and then clasping his hands in adoring delight at the sight of a great dish of magnificent truffles, he exclaimed: "*Tartoffalli! tartoffalzi!*"—the Italian name for this tuber. His sensual ecstasy impressed the word on Moliere's memory, and out of it he made the name of Tartuffe, which he gave to his celebrated personation of sanctimonious hypocrisy. Rossini was also exceedingly fond of truffles. One day, when dining with Victor Hugo, seeing the poet mixing them up on his plate with vegetables and the gravy and meat of a ragout, he could not repress a pained exclamation. "What is the matter?" asked his host. "As a poet, I admire you," answered the illustrious maestro, "but as an eater, I despise you." To have truffles and bananas as cheap as potatoes was a utopia which Balzac unsuccessfully attempted to realize at his country house; and Byron once called truffles, "edible roses." A goose is carved the same as a wild duck (this is also the case with a tame duck) and should be served up with turnips or olives. It should be sufficiently well done for it to be possible to carve it with a spoon or the point of a knife. Pigeons when roasted are divided into four pieces. When no company is present the most equitable way is to cut a pigeon in two longitudinally.

REVOLUTIONIZING NATURE.

TO BLOW UP THE NORTH POLE WOULD MAKE THE ARCTIC REGION HABITABLE.

Did Nature intend the Arctic Sea to be open, and the climate moderate? And is it possible to do by means of dynamite what Nature has unaccountably omitted to do? These points are discussed in a phamphlet by Mr. H. A. H. Dunsford, C. E., which has just been published in London, We need only suppose for a moment (writes Mr. Dunsford) how matters would stand if the ice cap were removed from the north pole. The two warm streams would in that case flow in exactly the same course as they now take, but, instead of becoming chilled as is the case at present, would flow past the pole and southward as warm streams still. They would effectually keep the ice from re-forming, and do away with the excessive cold of the Arctic regions altogether.

Nature is, in fact, working towards that end, for the climate of the northern part of the northern hemisphere has been steadily ameliorating ever since the commencement of the historic period. In the time of the Roman republic the rivers in Gaul used to freeze over in winter, and Roman writers represent Germany as a land of frozen morasses. Compare the climate at present enjoyed by those countries with this description, and it will be at once apparent how great a change in climate must have gradually taken place. The records of the Hudson's Bay Company also show that the winter on the shores of Hudson's Bay has grown shorter at the rate of one day in ten years, the season during which the sea is open for navigation being now twenty days longer than it was 200 years ago. About the years 1815-1818 the ice barrier on the east coast of Greenland began to break up, as was noted at the time by Sir John Barrow, who regarded it as one of the most important, though least noticed, events in the history of the world. All this is evidence that the ice barrier is being steadily driven further north, and will eventually leave a channel by which the Japan current can flow unchecked through the Polar Sea from Behring's Straits to the Atlantic, in which case the existence of the remainder of the ice cap will be but of short duration, for if the warm currents can actually reach the ice they will soon solve the question without human assistance. At present they do not reach it; for the ice cap blocking the way leaves no outlet for them (the warm currents being of course surface water), and their course is arrested long before they come near it by a wide belt of cold water, for which there is no outlet except that the coldest part of it escapes by flowing under the ice to form the cold streams. As for the proposition that we can open the sea, we must remember that the ice is not of great thickness, that we have now powerful explosives that are perfectly effective when frozen, and that every mass of ice detached on the course of a stream flowing southward will float away of itself. I do not, of course, mean to imply that it will be easy, but that it is within our power to make a channel wide enough for a part of a warm stream to pass without losing all its heat on the way. We may notice also that explorers have reported open sea to the north of Greenland, and that the accounts that they have given us are circumstantial and cannot well be doubted. The main barrier with which we shall have to deal will be the belt of ice north and north-west of Greenland. Of course, until it is completed, the channel will freeze over every winter; but I do not think that the removal of the ice thus formed will be so serious a difficulty as might be expected. The ice being caused merely by the freezing of the channel will be smooth, not hummocky, and after the first snowfall can be traversed easily by sledges or dog-trains, so that surface or submerged mines can be laid, enabling the ice over any desired length of section to be broken up instantaneously so soon as the winter is over. The advantages to be gained by the opening of the sea and the amelioration of the climate can scarcely be overestimated. The rendering habitable of the shores of the Arctic, and the growth there of civilized communities; a direct route to the Pacific and an immense increase of trade with the Pacific coasts of America and Asia; lands suitable for colonization, within easy reach of Great Britain, and which in great part belongs to the British empire; valuable fisheries; a considerable and increasing trade in the Arctic itself; and comparative if not total immunity from storms in the North Atlantic, the principal if not the only cause of storms being the difference in temperature between the poles and the tropics.

Good Suggestion.—Cannot some inventor contrive a street cleaning machine which shall do more than simply brush the dirt to one side or the other of the street and leave it in windrows? There is demanded something which will take the dirt up bodily and put it into a box to be carried with it until the machine has reached the end of the route or the box is full.—*Scientific American, March* 22.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

May,

Meats.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

Game and Poultry.—Brant, pigeon, chicken, duck, turkey, goose, snipe.

Fish.—Anchovy, bass, catfish, cod, eels, clams, flounder, halibut, herring, lobster, mackerel, mussels, perch, porgie, rock-fish, salmon, shad, shrimp, turtle, trout, sturgeon, whiting, weak-fish.

Vegetables.—Artichokes, beans, carrots, garlic, lettuce, onions, parsley, parsnip, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

Vienna Veal Cutlets.—Cut your cutlets into pieces an inch thick and two inches square, beat them a little with a heavy bladed knife, and dust them with pepper and salt. Put enough lard in a frying pan to make it half an inch deep when melted, and let it get smoking hot. Beat to a stiff froth the whites of two eggs, dip the cutlets in them, roll them in fine dry bread crumbs, and fry them brown in the fat, turning as soon as one side is done. When done, sprinkle with a little salt and serve.

Codfish Pie.—Cut a good piece from the middle of a fish, salt it well all night, in the morning wash it, season with salt, pepper, a little nutmeg, a little chopped parsley and some oysters. Put all in your dish with bits of butter on the fish. Pour in a cup of stock and cream, cover with a good crust and bake.

Cocoanut Cookies.—One small cupful butter, one and one-half cupfuls sugar, two eggs, one cupful grated cocoanut, one-half cup sweet milk, one teaspoonful vanilla, flour enough to make a soft dough in which has been sifted one and one-half teaspoonfuls Horsford's baking powder. Roll out, cut into cakes and bake in a quick oven.

Marble Cake.—Dark Part: One-half cup butter, one cupful molasses, one cupful brown sugar, one-half cup sour cream, two and one-half cupfuls flour, one-half teaspoon each of soda, cloves, allspice, nutmeg and cinnamon, yolks of four eggs. White Part: One-half cup butter, one cupful white sugar, one-fourth cup sweet milk, two cupfuls flour, one teaspoonful baking powder, the whites of the eggs. Put some of the dark part in the cake pan, then a spoonful of the white, and so on, making it look like mottled marble when cut.

Beautiful Cake.—Two cupfuls butter, three cupfuls sugar, five cupfuls flour, one pound fruit, one cupful milk, five eggs, two heaping teaspoonfuls baking powder sifted in with the flour.

Chocolate Custard.—Boil together one quart of milk, two ounces chocolate, until thoroughly mixed, take from the fire, and add four well-beaten eggs. Flavor with vanilla. Serve very cold.

Puff Puddings.—Beat thoroughly six eggs, to them add six spoonfuls milk and six of flour; butter some cups, half fill with the batter and bake quickly; turn them out and eat with sweet sauce.

DIGESTION AND ITS DISORDERS.

It is not at all surprising, when we consider the purely aesthetic and economical principles which have hitherto governed the choice of food, that disordered digestion and what is popularly styled dyspepsia are the most common of human ailments. In diseased conditions of the body, the digestive function is either weakened or entirely suspended for the time, so that a sick person is, in this sense, always more or less a dyspeptic. But many who consider themselves otherwise healthy people, and who are actively engaged in business, find in some form of digestive trouble the bane of their existence. They may even live to old age, though tormented half their days with dyspepsia. Others have learned by experience that attacks of indigestion can only be avoided by exercising great care in the choice of food, and by observing rigid rules as to quantity and regularity, the slightest transgression being followed by punishment. Digestive disorders, therefore, result naturally both from eating food unsuitable in quality or quantity, and gastric impairment or incapacity; or, to summarize, to a want of relation between the food to be digested and the organism, owing to which the latter finds itself unduly embarrassed in its duties, or entirely incompetent to perform them. But, we may ask, are there no special causes contributing to this result? What agents may disturb this relation? Experiment outside the body has demonstrated that, in the normal condition, the digestive secretions, whether from the salivary glands, from the stomach, or from the liver, show a remarkable power of resistance to putrefaction, and though food is in the most favorable condition for putrefaction it does not occur in health ordinarily. We need not enter into the details of the digestive process, it suffices to say that the food from the time it is taken into the mouth, is constantly under the influence of certain fluids aided by muscular action which keeps the mass in constant motion. In twenty-four hours the food is subjected to about twenty pounds of digestive fluids (saliva, 1 to 3 pounds; gastric juice, 14 pounds; pancreatic secretion, ¼ pound; bile, 3 to 4 pounds; intestinal juice, ½ pound). Although the total quantity of these fluids seems large, it must be remembered that they are absorbed almost as soon as they are poured out, so that there is no excess of fluid in the tract during digestion. The quantity thrown out is also affected by the nature and quantity of the food, and many other conditions. Digestion has been therefore considered a rinsing process in which the proximate elements of food are first made soluble and dissolved, and then absorbed through the epithelium of the stomach and intestines. It must, therefore, be plain that to keep the processes of digestion in working order the vessels wherein the digestive fluids are prepared, stored and do their work must be kept clean and in order, all effete matter must be removed, and all deficient elements supplied. To accomplish this, no other medicines are so effective as Ayer's Cathartic Pills and Ayer's Sarsaparilla—the first to cleanse the alimentary canal, and the second to assist the digestive organs in forming good blood, on which the health of the body so largely depends. Innumerable cases of dyspepsia have been permanently cured by these well-known standard remedies of the J. C. Ayer Co., Lowell, Mass.

BUSINESS NOTES.

GORDON & DILWORTH.

About the only house putting up American fruit jams whom the foreign makers consider a competitor, is the old and well-known firm of Gordon & Dilworth. They have established such a reputation for first-class goods, pure and unsophisticated, that any goods bearing their label are bought with perfect confidence, and need not be urged on reluctant customers by over-zealous grocers. Probably this firm's goods are the only American preserves for which there is enquiry. As one grocer remarked, they sell themselves. People who have had any experience in marketing always give the preference to their label. It is truly a proud position to hold, and the hard and faithful toil to obtain and maintain it justly entitles them to this distinction.

VILLACABRAS WATER.

Villacabras water is a new aspirant for the favor of the American public. It is a natural mineral purgative water and not a table water. A French company own the spring, which is situated near Madrid, in Spain. It has received the indorsement of the French Academy of Medicine, and its introduction and sale in France has been duly authorized after a very careful examination by the French government. In the United States, where Messrs. Gourd & Tournade are now introducing it with great success, no less an authority than Professor C. P. Chandler says, that it is one of the strongest and most powerful waters of this character that he has ever seen. Being a pure unsophisticated mineral water it is likely to be generally adopted.

SILVER PLATING.

The Ready Silver Plating Company, of Warsaw, Mo., have a powder they call "Always Ready Silver Plating." They claim for it that it actually contains coin silver and when applied to the baser metals will give them the appearance and durability of silver. It is different from all plating powders heretofore used, and is not a mere cleaning powder. They guarantee this powder, and will refund the money if the powder is not found satisfactory after trial. They also want to establish agencies everywhere. This would seem to be a good opportunity for those desiring such agencies. At all events the powder deserves a trial. This is all the Company asks, and they are willing to abide by the result.

THERMOMETER SCALES.—Three scales have survived. The Fahrenheit is the oldest, and dates from 1724. It is used popularly in Great Britain, the British colonies, and the United States. This scale was primarily divided into 180 dg.; zero was placed at temperate, a point corresponding with 9 dg. C.; the point to which the alcohol rose when placed under the arm of a healthy man was marked 90 dg.; and the temperature of a mixture of ice and salt, then believed to be the greatest possible cold, was marked—90 deg. In 1714 Fahrenheit again altered his scale; 0 dg. was placed at the absolute zero, and the space between this point and that representing the warmth of the human body was divided into twenty-four degrees. The freezing point of water was now 8 dg. But these long degrees being inconvenient, each was divided into four, and thus, instead of 8 dg. the freezing point of water became 32 dg., and the blood heat 96 dg. A mercurial thermometer thus graduated registered 212 dg. as the boiling point of water.

SCRATCHING FOR FEVER.—Dr. Alois Fenykovy communicates to a Vienna medical journal an account of some observations made on the treatment of intermittent fever by means of friction of the back along the spine. Many years ago, as stated in the *Lancet*, while at Nisch with his regiment, there occurred so many cases of intermittent fever that the stock of quinine was becoming exhausted, and, in order that patients might not be entirely without some kind of treatment, it was ordered that they should be rubbed twice a day along the spine with simple ointment. The day after this order had been given, it appeared that the usual attack had not come on. Accordingly, since that time Dr. Fenykovy has very frequently employed this treatment, and usually with marked success. Indeed, he says that three-fourths of his cases have done very well without any quinine at all.

COCAINE PENCILS FOR THE SKIN.—A writer in the *British Medical Journal* makes a suggestion which is easily convertible into a capital article for a cosmetic "special." It is, in short, a pencil or "stick" for use on the chafed and irrated skin, or on skins very susceptible to insect bites, etc. He says that an addition of two per cent. of cocaine to the ordinary cocoa butter pencils converts the latter into a cosmetic remedy, which gives almost instant relief when rubbed over the irritated spot.

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CONTENTS.

PURE FOOD PROSPECTS.

The subject of Congressional legislation in behalf of pure food is not conspicuously discussed, as it probably is not fully understood, by the general newspaper correspondent in Washington; and since the matter has been intrusted to a committee of each house, in whose hands it still rests, it is not easy to secure definite information respecting it on which to base conjectures as to the probable result. The correspondent of the *Commercial Bulletin* of this city recently wrote at some length on the subject, expressing the opinion that the prospect of an anti-adulteration law passing is somewhat more encouraging than it was a few weeks ago. The preparation of a general bill regulating the adulteration of foods is in the hands of a sub-committee in the House, made up of Messrs. Allen of Michigan, Hill of Illinois, Wilson of Kentucky, Morgan of Mississippi, and Brookshire of Indiana. They have before them the bill recently introduced by Mr. Allen, defining adulteration and prohibiting it in articles which are the subject of inter-State commerce. The principle is the same as that of the bill of Senator Paddock of Nebraska, already discussed by the AMERICAN ANALYST, and it was prepared, like that measure, in consultation with the officers of the Department of Agriculture. The sub-committee intend to report such a bill to the full committee, and it will probably be reported to the House. The sub-committee is now working on the details and waiting for the action of the Senate committee. Such a measure, however, the writer thinks, is likely to encounter vigorous opposition in both houses. The combined power of the manufacturers of all kinds of adulterated foods—many of them entirely harmless, but adulterated to make them cheaper—would be able to influence the representatives of a good many districts, and probably tie the bill up somewhere so that it could not get to the President. But the greatest danger, according to the *Bulletin's* correspondent, which threatens pure food legislation during the present session, is "the determination of the House Committee on Agriculture to force the consideration of the Butterworth bill against futures and options. The Committee on Rules is disposed to give two days to the Agricultural Committee for the consideration of such measures as it may choose to bring forward. If these days were devoted to sensible legislation, much might be accomplished. It is not unlikely, however, that the Committee, with their strong feelings in favor of the Butterworth bill, will place that first on their programme. This will result in wasting all the time, with little practical result. It would be possible, of course, to limit debate arbitrarily and force a vote without full discussion, but such a course would hardly be adopted in the absence of pressing political exigency. If the Butterworth bill is forced ahead of everything else, under the deceptive pretense of benefiting the farmers, it is likely to defeat any practical measures for the farming community. If the Senate bill regulating exports were put first, it might be passed in a short time, and several hours be given to the Conger Lard bill and the general Food bill. The Conger bill will be strenuously opposed by Democratic members, who believe that it is a perversion of the taxing power to illegitimate uses, but it will command a large support, because so many of the farmers demand it. If it is voted on it is likely to pass the House."

INVENTORS' RISKS FIFTY YEARS AGO.

Persons of the present generation, to whom the photographer's art is a commonplace, everyday notion, are not always aware what a recent discovery it is. The following story is related by the Rev. R. Heber Newton in the May *Arena:* "What fact more commonplace to our mind than the photographic process of portrait-taking! Many of us remember the original form of these sun-pictures—the daguerreotype—specimens of which, once in a while, we draw forth from some unexplored drawer, carrying us back to the forgotten days of childhood. It was no further off than 1838 that Madame Daguerre, the wife of the inventor of the process, had an earnest consultation with one of the medical celebrities of the day concerning her husband's mental condition. After acquainting the physician with the many indications of Daguerre's mental aberration, she added, with tears in her eyes, that the concluding proof of his insanity was his absolute conviction that he would succeed in nailing his own shadow to the wall or on fixing it on magical metallic plates. The physician listened with profound attention to this culminating evidence of mental derangement, answering that he himself had observed in Daguerre strong symptoms of madness. He closed the consultation by advising that her husband should be sent quietly and without delay to the well-known lunatic asylum, Bicetre. Two months later the world of art and science was stirred to its centre by the exhibition of a number of pictures actually taken by the new process. Arago, in January, 1839, laid an account of the process before the *Academie des Sciences*, and soon the 'lunatic' was heralded as the father of photography."

SENATOR VEST ON AMERICAN BEEF.

The famous Dressed Beef Committee of the U. S. Senate, which, under the guidance of Senator Vest, of Missouri, has been creating such a stir during the past year in western beef raising and beef shipping circles, has at length completed its mission. On April 29th a report was formulated by the committee, to be presented in connection with several bills that Senator Vest had prepared for carrying out the recommendations the report embodies. Both the report and the measures based upon it are very much less radical in their character than either the inquisitorial investigations of the committee or the occasional brusque declarations of Senator Vest on the subject had foreshadowed. Stated briefly, Senator Vest's plan for raising the price of American cattle seems to be by enlarging and widening the foreign market. He recommends four distinct legislative propositions. The first is a joint resolution directing the Secretary of State to negotiate with Great Britain for a removal of the restrictions which it puts upon the importation of cattle from the United States by its system of seaboard inspection. The second is a bill to insure proper facilities for the shipment of live cattle abroad. It appears that one firm has contracts with the steamship companies which practically control this trade, and that other shippers frequently cannot secure carrying facilities, though there may be steamship accommodations. Another bill relates to dressed beef. It provides for the inspection by officers of the United States of the animals which are to be killed and converted into dressed beef products. As drawn by Senator Vest, the inspection of the dressed beef was to be at the port of export. Senator Farwell pointed out that this was impracticable, and the bill was modified so that the live animals are to be inspected at the place of slaughter, and certificates given. A fourth bill recommended is domestic, and relates to interstate commerce.

It forbids discriminations between live-stock shipments in ordinary stock-cars and in what are known as palace stock-cars. Much complaint has been made about the alleged rebates given by the railroads to the palace-car shippers, and the bill aims to put all shippers on an equality by compelling the railroads to make the same terms.

A NEW FEATURE.

By an arrangement with the N. Y. Hay Exchange, we publish in this issue, and shall continue to do so in every number hereafter, the official bulletin of the state of the hay market. It will appear exclusively in the American Analyst. As there are thousands of hay-shippers in the United States, besides a large number of farmers who will be interested in this bulletin, we look forward to a considerable increase of our subscription list. All these new readers are welcome and their addition will be appreciated quickly by our advertisers.

HOW TO TAKE WINE.

ITS PROPER INDULGENCE.—AN INTELLECTUAL STUDY NOT A DEMORALIZING VICE.

Dry wine is the only healthful wine, from the fact of its containing no sugar and little alcohol. The grape is used when there is only about 22 per cent. of saccharine. After fermentation there remains 10 or 11 per cent. alcohol, and no sugar. The grapes for sweet wine are allowed to become very ripe, and used when there is from 30 to 40 per cent. sugar. It is fermented into about 15 per cent. alcohol, and then brandy is added to prevent further fermentation in the bottles. In drinking it the heat of the stomach causes fermentation: result, headache, gout, and possibly an uncontrollable appetite for strong drink. The temperature of wine is a most important feature. Wine is like a delicate flower and should be treated as carefully; otherwise, as a lily touched by frost, it will droop and its full life and beauty never return. Champagne should be chilled but once, and then only 15 or 20 minutes before it is used. Claret should be gradually warmed and drank at a temperature of 70 or 75 degrees, and never drank at all excepting with meats. It is a common thing to see ladies add ice and sugar to claret. They might as well add sugar to vinegar, or resort to their usual relish—pickles—for claret, with ice added, becomes nothing more or less than vinegar. The old custom of serving many wines at banquets has sensibly been done away with. Now one sees only sauterne with the oysters, sherry or madeira with the soup, burgundy or claret with the meats and entrees, these grosser wines preparing the palate for the most delicate of all wines—champagne. A serious mistake is the supposition that pure wine will not deposit sediment. It is only the pure wines that have sediment. An absolutely clear wine has either been in bottle but a short time or else has been "fixed" by acids to prevent this deposit, the latter making it injurious to health. There are comparatively few in America who know how to overcome this sediment, though it is generally practised in France. It can be overcome only by "decantation." Wine showing this sediment should be placed upright for several hours or a day before it is to be used. When the sediment is thoroughly settled at the bottom of the bottle and the wine perfectly clear, the cork should be withdrawn carefully and the wine poured into another bottle or decanter. To do this requires the utmost care. By holding the bottle about twelve inches from a gaslight and stopping immediately the sediment reaches the mouth of the bottle—it is not a difficult matter. The sediment is caused by the changes going on in wine as it ages. Red wine derives its color from the skins of dark grapes, which are fermented with the juice or "must." It is generally supposed that white wine is made only from white grapes. It is not necessarily so. Many fine white wines are made from red and black grapes. To make white wines from dark grapes the juice is separated from the skins. White grapes can only produce white wine, however, and the skins are never put with the "must." It is hardly necessary to say there would be a good deal of a struggle between self-respect and adulterated wines. Wine, when adulterated, generally wins the battle. A not very new incident is that told of a dying Bordeaux merchant. He called his son to him and said: "My son, one last word. Remember this: You cannot make wine from anything but grapes." Some of the importations to this country are sacred to the advice of that dying man. Champagne is the finest of all wines. Notwithstanding the fact that everybody drinks champagne, there are not many who know just what it is. It is a "blend" of the different wines, and sometimes from ten to fifteen wines are used. One is chosen because of its flavor, while it may be deficient in body. Another is taken because of its body; by the way, "body" of wine does not mean alcohol; it signifies roundness or richness. Another wine is put in for some other quality, and so on, making one grand combination. When "blended" the combination is called a "cuvee." After a certain time the cuvee is placed in bottles and allowed to ferment for a period of about two years. The fermentation causes sediment to be deposited and develops carbonic acid gas, which is the life and sparkle. At the end of two years the bottles are placed "surpointe," or corks down, and the sediment allowed to settle on the cork. During the two or three months the bottles are "surpointe" each bottle is shaken separately every day. Then skillful workmen release the cork, and the sediment (which has become compact) and cork fly out together, and only a little wine is lost. In place of the wine that is lost a small quantity of syrup or liqueur is added to give necessary sweetness. It is here that fraud, if fraud there be, comes in. In making the liqueur an opportunity is afforded for flavoring or increasing the alcoholic strength of the wine. After the syrup is added the bottle is corked with the most expensive corks that can be bought. Following this process the perfection of the wine depends upon the quality of the cork. During the two years of fermentation in bottle the breakage from pressure is sometimes great, ranging from 4 to 20 per cent., which of course must be paid for when the champagne is purchased. It is a debatable question whether champagne, like other wine, improves by age. As a rule it is put on the market from two to five years after it is "blended." It would be treason to our own country to say there is any snobbishness in America. It certainly does take a good deal of courage for a hostess to set California's product on the table, or for an elegant fellow, thoroughly well posted in everything worth knowing, to order wine with an American label without duty price, while his neighbor at table d'hote not only flashes his diamonds but flourishes a "Chateau Lafitte" certificate in his face, for which he has paid full tariff. However, Americans are awakening to an appreciation of our own wines. They are getting tired of the impositions practised, not only in the wine districts of France, but in this country as well, and the demand is for the pure article. We often see grand Chateau wines listed at hotels and sold from wine cellars in this country at prices that ought to convince one they cannot be the genuine article. A chateau wine with the duty added must necessarily be high priced. At comparatively low figures they are either California wines with French labels or no wines at all—simply acids—tannin, water, spirits and coloring matter. Beware of the wily merchant who offers you cheese while proving to you the quality of his wine. After the bait is taken any wine or imitation will seem perfect. It is claimed that the decrease of drunkenness in the State of California is due to the fact of the general use of wine, that the pure article destroys the craving for stronger drink. It is certainly a fact that Californians are becoming famous for their beautiful complexions —"beautiful" for the ladies, "fine" for the gentlemen—while only a few years ago the reverse of it was noticeable. Now that we have learned to drink wine, if we can overlook the fact that our own wines are not yet mellowed by the age that gives wine its smoothest completeness, like "bottled velvet," and consider the purity of the home production, possibly there may be fame in the future for the complexion of Americans.

CACAO AND CHOCOLATE.

THE AMERICAN ARTICLE THE PUREST AND BEST PROCURABLE.

A writer in the *Western Druggist* has been to Caracas, and, like a great many other Americans, about the only people whom foreigners can convince that everything foreign is superior to the manufactures of their own country, has been talked over into writing the following nonsense:

The good people down there say that all the best cacao goes to Europe, and not a pound of El Criollo to the United States. They say, too, that we eat the miserable product of Mexico, Brazil and the Central American States, which does not approach in quality the Venezuelan fruit, and even our manufacturers adulterate it so that it does not taste naturally. And it does not require an expert to detect the difference between a piece of Venezuelan chocolate and a piece of Mexican or Brazilian. It is an actual fact that you can buy chocolate in the United States at the high-priced retail stores for about half the money that is charged you at the Caracas factories. The best in Caracas is eighty cents a pound at the factories, and the retailers charge about one dollar for it. You can get a superior article for sixty cents, and the ordinary are fifty cents a pound. None can be had less than that, while in the United States it can be bought at all the groceries for twenty-five, thirty and forty cents a pound. The Caraqueans say that our manufacturers cannot possibly produce an honest cake of chocolate for that price, but adulterate with pipe clay, flour, and other foreign substances.

We have European chocolate in this country, and none of it is considered any better, if as good, as our best American make. The inference is also made that the only manufacturers who adulterate chocolate are Americans. This is absolutely false and just the contrary is the truth. The American Analyst, by actual analysis, has proven that nearly all the Dutch chocolates are adulterated with cacao shells and alkalies, that most of the German chocolates are vile trash, that the English sell arrowroot for chocolate, and that the French never

send their best goods here. It is, therefore, obvious that American chocolates which have been proven to be pure and unadulterated are in every way superior to the imported trash. The alleged cheaper prices here, which are dwelled upon as evidence of the superiority of foreign goods, are largely due to American skill and ingenuity in manufacturing, improved labor-saving machinery, and that peculiar American enterprise which always carries off the victory where the competition is anywhere near to being fair. When the Caraqueans wake up from their *dolce far niente* methods of doing business, they will find that Americans can buy their cacaonibs, pay freight and duty, and then return to them a better and cheaper chocolate than they make at home in their old-fogy way. Let Americans use their own judgment and not libel their country

GELATINE.

ITS NATURE, QUALITIES AND USEFUL APPLICATIONS.

In various animal tissues, such as the skin, bones, intestines, etc, is found an interesting group of organic compounds, very closely resembling each other, and which, when treated with boiling water, are transformed into the well-known and exceedingly useful substance gelatine, which is the same as ordinary glue, differing from it only in purity. The most characteristic property of gelatine is that of solidifying, or gelatinizing, when solutions containing it are cooled below 68 deg. A solution in water containing only one per cent. of gelatine will form the characteristic "jelly" when cooled. Common glue is prepared from the trimmings of hides and the refuse of slaughter-houses and tanneries. The skins are cleaned and steeped in lime water, and afterwards exposed to the air for some days. They are then boiled in water, and the resulting liquid run off and allowed to settle, after which it is left to cool and gelatinize in shallow boxes. The resulting cakes of soft glue are then dried on nets in large buildings, provided with movable blinds, so that the air can freely circulate through them in pleasant weather, while during storms the glue can be protected from the weather. This process of drying requires great care, as a rise in the temperature may cause the partially dried glue to liquefy, making a "mess" which requires much labor to clear up, to say nothing of the loss or damage to the stock. It was formerly supposed that glue could only be dried at temperatures above the freezing point, but it was accidentally discovered in this country that frozen glue was of equally good quality, and the manufacture is now carried on all the year round. Cooking-gelatine is practically made by the same process, but much greater care is taken in selecting the stock, and the utmost cleanliness is necessary in all the processes. It forms a healthful and attractive article of diet, but its nutritive value is not very great. By long-continued boiling gelatine loses its gelatinizing power. The same result is obtained by adding nitric or acetic acid to its solution. The ordinary liquid glues are made in this way, and a very good article may be extemporaneously prepared by throwing some pieces of glue into a bottle of vinegar, and shaking occasionally until it is dissolved. When chlorine gas is passed through a solution of gelatine, it unites directly with it, precipitating an insoluble substance, and forming a very peculiar looking solid froth. Gelatine also unites with tannin to form an insoluble compound. This reaction is the basis of the tanning process by which raw hides are converted into leather. A minor application of this reaction is found in the use of fish skin for settling coffee. The tannin of the coffee and the gelatine of the fish skin unite, forming a solid, tenacious mass, which mechanically encloses the impurities suspended in the coffee, in the same way as the coagulating albumen of the white of an egg, often used for the same purpose. When gelatine is placed in cold water, it softens and swells, but does not dissolve. On heating the water, however, it dissolves immediately. If some bichromate of potash is added to the gelatine, it still remains soluble if kept in the dark, but if exposed to the sunlight a chemical change—probably an oxidation—takes place, and it becomes perfectly insoluble, even in boiling water. This property is of the greatest value and importance, as it is the basis of all the modern processes of photo-engraving, which have enabled us to make exact reproductions of the most celebrated works of art at a nominal cost. The ordinary kind of gelatine is also indispensable in the manufacture of photographer's dry plates, which are coated with an emulsion of gelatine and finely-divided sensitive salts of silver, and, after drying, will retain their sensitiveness for years without change. The collodion-coated plates formerly in use became worthless in a very short time after being prepared. The minor uses of gelatine are innumerable. When combined with glycerine, it forms a soft, elastic mass, which is used for printers' ink-rollers, electrotype moulds, and for taking casts of irregularly shaped objects. The surface of this compound readily absorbs the aniline dyes, and this property is taken advantage of in the hectograph copying pad, which consists mainly of a shallow tray filled with this composition. Characters written on paper with aniline ink are transferred to the surface by simple pressure, and a large number of copies may be taken in the same way, as the gelatine readily yields sufficient of the color to fresh sheets of paper, when pressed upon it, to give a clear reproduction. Some fruits contain gelatinous principles known as pectic and pectosic acids, but they are entirely different substances from the true gelatine. It is these substances which render it possible to prepare fruit jellies, but they have much less gelatinizing power than the animal product. The cheap manufactured fruit jellies are frequently found to consist of animal gelatine, properly flavored, and to be entirely free from the pectose compound which should legitimately be present.—*Popular Science News.*

MICROBES IN MORTAR.

THE PRESENCE OF DISEASE GERMS IN BUILDING MATERIALS.

The notion that building material may have infectious properties and may take a part in the propagation of various disea es, seems a strange and possibly far fetched idea; yet the importance of this question is very great, certainly far more considerable than any one would be likely to imagine at a first glance. The fact is that since the science of microbiology has come upon the scene there is scarcely a single problem either of medicine or hygiene in which it does not have to be taken into account, and in which we are not forced to be guided by what it has taught us. This necessity becomes especially marked when we undertake to seek for the origin of infectious diseases and when we wish to ascertain the most suitable means of checking their ravages. Knowing as we do the part that microbes play in the development and propagation of infectious diseases, it will be easy to understand how much it is our interest to prevent, as far as it is in our power to do so, these microbes from coming in contact with us in any way, to track them out wherever they may be found, to destroy them or at any rate to reduce them to such a condition that they will no longer be harmfull and to make the surroundings in which we ourselves are destined to live unsuitable for their habitation. We can only attain this end by acquiring a thorough knowledge of their habits, of the way in which they spread and develop, and of the degree of their vitality and power of resistance. In this connection the researches which M. V. Bovet has been carrying out quite recently are, in our opinion, of special interest. M. Bovet has been striving to verify the presence of germs in places where no one before him had thought of going to look for them—in the substance of the walls of our dwellings, or rather in the materials which are used in constructing them. Plaster, gypsum and mortar take the leading place among these materials, as they are used either to cement the stones and bricks together, or else to cover their surface, at least the surface which forms the walls of our apartments. He first found that the water with which these substances are mixed is itself highly infected and is most usually fairly swarming with every variety and category of microbes. When the plaster hardens these microbes find themselves inclosed in the mass, but M. Bovet has demonstrated that they are by no means destroyed on this account, and that in their new abode they continue to retain their power of action for a long time. When the plaster of which the walls are made becomes thoroughly dried it gives rise to dust, which carries away with it the microbes which had been enclosed in the mass, and in this manner it becomes a means of transportation of contagion. The same thing takes place with other kinds of building materials, with the different forms of soft stone, &c., which resemble plaster, more or less, by their porosity and density. M. Bovet carried his researches further still, and has found that microbes can also be discovered in the different kinds of wood which are used in large quantities in the materials to which architects resort in building houses. This is more so the case with old wood of a loose texture, containing only a small amount of resin and often wormeaten, than in green, hard-fibred wood, abounding in resinous substances. The same remark holds true for still other materials used in our dwellings—the paper with which we cover our walls, the hangings and upholstery. It will not be difficult to understand that these d fferent substances form surfaces pre-eminently fitted to gather and hoard up all the micro-organisms that come within their reach, only to pour them back into the surrounding atmosphere during the process of housekeeping to which apartments are daily subjected in order to keep them clean. Should we be satisfied merely to ascertain the facts of which I have just spoken? Most certainly not. It would be a most barren science that would simply occupy itself with discovering an evil without trying at the same time to find a remedy for it. For this reason several means have been suggested to protect ourselves against, to annihilate, or at least to neutalize the action of these domestic microbes and to prevent their baneful effect when they are spread throughout the air that we breathe. The first suggestion that was made was that we should wash our walls with a solution of corrosive sublimate, which is a substance well known for its energetic properties as a destroyer of microbes. But this is a means that could not be relied on; and besides this, it would be dangerous on account of the poisonous nature of the salts of mercury. It does not seem that we should succeed any better with the different forms of fumigation or by washing the walls with thymic or salicylic acids, as the latter would not be sufficiently powerful; furthermore, salicylic acid could not be used, for the simple reason that it damages the colors of wall papers and hangings. M. Bovet, who has gone into this question at some length, proposes for its solution the following plan. He thinks that the desired result will be accomplished by using in the future in place of the ordinary water that is now taken for mixing plaster or mortar a solution of salicylate of zinc, which is a very antiseptic substance, and is to be had at so modest a price that it will be quite within the reach of the majority of architects. He thinks that by this means the microbes will be destroyed at the beginning, *ab ouo*, so to speak; that we shall no longer shut up within our walls anything but dead germs, utterly incapable later on of spreading far and wide disease and death. M. Bovet's conclusions, as well as the series of researches by which the writer was led to them, have a stamp of originality and of genuine scientific precision that cannot be denied. It seems to us highly probable that the hygiene of our dwellings and the architects' profession will profit by them at no very distant day.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

May,

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, catfish, cod, eels, clams, flounder, halibut, herring, lobster, mackerel, mussels, perch, porgie, rock-fish, salmon, shad, shrimp, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Artichokes, beans, carrots, garlic, lettuce, onions, parsley, parsnip, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

CODFISH AND TOMATOES.—Cut some codfish into pieces about six inches square and soak it over night. In the morning put over the fire in cold water, and let it come to the boil; remove it and take out the bones. Pour into a fryingpan a cupful of oil, and in it fry brown three chopped onions; when brown, add a can of tomatoes, a dozen cloves, and eight Spanish peppers. Boil for a while, add the fish. Boil a while longer and serve.

MACARONI MUTTON.—Put in a stewpan some thin slices of mutton, quarter pound macaroni, pepper, salt, a little water, a tablespoonful vinegar, sauce of any kind. Stew gently for an hour and a half, keeping the pot tightly covered.

GRAHAM GEMS.—Sift half a pint wheat flour and mix it with half a pint graham flour and a good teaspoonful salt. Stir in one pint sweet milk, and lastly two eggs slightly beaten. Butter some iron gem pans; make them snapping hot, pour into each two tablespoonfuls of the batter, and bake.

PASTRY SANDWICHES.—Roll a piece of puff paste into a large sheet and lay it on a baking tin; spread the paste with fresh fruit well sweetened or with preserves; lay over this another thin sheet of paste, press together at the edges, and with a sharp knife mark the paste into diamonds so that it may be easily cut when baked. A little before it is done, take from the oven, brush with the white of egg, sift powdered sugar over it, put back in the oven to color. When done cut into diamonds and serve either hot or cold.

SANDWICH DRESSING.—Mix together very smoothly half a pound nice butter, three tablespoonfuls mixed mustard, three tablespoonfuls sweet oil, a little white or red pepper, a little salt and the yolk of an egg. Chop some tongue and ham together very fine; cut some bread thin, spread it with the dressing, then with a layer of meat; put on another layer of bread and press it hard; with a sharp knife trim off the edges, and make all the sandwiches the same size.

SWEET POTATO PUDDING.—Beat to a cream two pounds boiled sweet potatoes mashed fine, one pound sugar, one pound butter, five eggs, one cupful milk, and a wineglassful of wine. Bake in a crust.

LITTLE FRUIT PUDDING.—Make a batter with one pint milk, two eggs, one teaspoonful baking powder, and enough flour to thicken. Take jam, or chopped peaches or apples or berries well sweetened, and fill cups with alternate layers of batter and fruit. Set the cups in a steamer and cook for an hour. Serve hot, with sugar and cream.

LOBSTER CULTURE.

ARTIFICIAL PROPAGATION OF LOBSTERS.

The people of Newfoundland, recognizing the danger of the extinction of the lobster fishery, have resorted to artificial propagation, with a fair degree of success. Until recently, it was believed that the artificial propagation of the lobster was impossible, as, unlike the true fishes, it does not shed its spawn freely on the sea. The best naturalists now hold that the ova are fertilized within the body of the female. When expelled they attach themselves by a glutinous substance to the enormous hair-like appendages, swimmarettes, or fibrils, under the tail of the mother. To those they adhere until hatched, a period extending over several months. The movements of the mother keep them constantly in motion. Each mother lobster carries from 12,000 to 18,000 or 20,000 ova under its tail. The process of hatching which has been initiated at Newfoundland aims at saving these fertilized ova by removing them from the captured mother fish before they are canned in the factory, placing them in properly constructed hatch-jars, in which a constant flow of pure sea water is kept up till they are hatched. The young fry are kept till sufficiently strong to take care of themselves, and are then liberated to begin the battle of life on their own account. Last year five millions of lobsters were hatched in this way, and planted in the waters of Trinity Bay.—*Cape Ann Advertiser.*

ROYAL BREAD.

THE SORT OF BREAD SERVED ON QUEEN VICTORIA'S TABLE.

The Queen's partiality for Viennese and French bread runs into all sorts of shapes. There are long French loaves and twists and rolls, and the Viennese bread is shaped into all sorts of curves and twists. There is one roll made like a little manikin. This is supplied for the edification and amusement of the Queen's small grandchildren when they sit at Her Majesty's table. The Queen is always supplied with this bread when at Buckingham palace. Her baker is S. Petrozywalski, a Polish refugee, in whom the Prince Consort took a great interest. This fancy bread is only supplied for the Queen's table; for the rest of the household the palace baker bakes. Some of the larger loaves supplied to the Queen cost ten-pence each. She did have this bread from London sent down to Windsor, but owing to the late arrival of the train that conveyed it, or something of that sort, this was given up. When the Empress Frederick was staying with the Queen, rye bread, of which the Empress is fond, was sent to the palace. The Queen's bakers have always been able to satisfy the Queen. She pays regularly once a month and does not demand Sunday bakings. When some of Mr. Petrozywalski's customers have grumbled that they didn't get fresh bread Sundays Her Majesty's forbearance was quoted, and this usually stops their complaints. The same baker also supplies the Princess of Wales and other members of the royal family, and although the Queen always has her confectionery and cakes made in her own kitchen, the Princess of Wales and the Duchess of Connaught, who share the characteristics of having a sweet tooth, occasionally order lunch cakes and other good things. The Queen, it may be mentioned, doesn't like freshly baked bread. It is always a little stale.

LIQUEURS AND CORDIALS.

If "a good wine needs no bush," a good liqueur requires but little comment or praise. Its delicious perfume and flavor, its tonic and stimulating properties, are known to all who appreciate good living. Its composition is no secret. As far back as 1780, it was laid down as a law that "a good liqueur must contain enough alcohol to defy decay, enough sugar to please the palate and enough medicine to cure the sick." Liqueurs are perfumed and sweetened spirits prepared for drinking and for use as a flavoring material in confectionery and cookery. A good liqueur, as the chemist and physician view it, is an alcoholic extract of aromatic or savory herbs, fruits, barks, roots, flowers, seeds or leaves, with enough sugar to make it practically a syrup. Many liqueurs, besides flavoring elements, contain medicinal ingredients. Of this class Chartreuse and Eau de Vie de Dantzig are the best examples. The vast majority, however, are simply beverages, whose chief characteristic is some pleasant or appetizing flavor. Liqueurs are made the world over. Their nomenclature varies according to the land in which they are made. Thus a multitude of terms are employed to express a simple fact, and as a result, a confusion exists which is difficult to understand. Ordinary liqueurs consist of certain mixtures of pure spirit and essential oils and vegetable extracts, and with syrup of refined sugar. A certain number of such preparations have an established reputation; but the methods by which these are compounded, and the precise proportions of the various ingredients they contain, are valuable trade secrets, scrupulously kept from public knowledge. The raw materials employed in the preparation of liqueurs are (1) a pure flavorless spirit which must be free from fusel oil; (2) various essential oils, on the purity and constant quality of which much of the success of the manufacturer depends, or in place of the oils, and what is better, the aromatic substances from which they may be distilled; (3) bitter aromatic vegetable substances, fruits, rinds, etc., or their alcoholic extracts, called tinctures; (4) fresh juicy fruits possessed of special flavor; (5) refined sugar prepared in the form of a perfectly smooth colorless syrup; (6) soft or distilled water; and (7) tinctorial substances for those liqueurs in which a particular color is demanded by fashion. What we have is as follows: The French, who originated these liqueurs, grade them according to their sweetness and alcoholic strength into cremes, huils, or baumes (balms), which have a thick oily consistency, and eaux, extraits, or elixirs, which, being less sweetened, are perfectly limpid. Liqueurs of British fabrication, generally of inferior quality, are frequently dealt in under the name of cordials. Bitters form a class of liqueurs by themselves, claiming to possess certain tonic properties and a medicinal value. Certain liqueurs, containing only a single flavoring ingredient, or having a prevailing flavor of a particular substance, are named after that body, as for example, creme de rose, vanille, the cacao, anisette, and kummel, etc. On the other hand, the liqueurs which in general are most highly prized are compounded of various aromatic principles, and they are not considered fit for use till they have matured and mellowed for several years. It is only the simple flavored and commoner varieties which are compounded by the addition of essential oils and alcoholic tinctures. Fine liqueurs are made by macerating aromatic bodies and subsequent distillation, bitters by maceration and straining. The liqueurs of commerce the most highly esteemed in the United States are Chartreuse, Curacoa, Maraschino, and Doppel Kummel, or Allasch. Of all kinds, the most famous is Chartreuse, so called from being made at the famous Carthusian monastery, near Grenoble. Three qualities are made, green, yellow and white, the green being the richest and most delicate in flavor. Chartreuse is said to be a most complex product, resulting from the maceration and distillation of balm leaves and tops as a principal ingredient, with orange peel, dried hyssop tops, peppermint, wormwood, angelica seed and root, cinnamon, mace, cloves, Tonquin beans, calamatus, aromaticus and cardamoms. Curacoa, which is a simple liqueur, is chiefly made in Amsterdam from the dried peel of the Curacoa orange. The peel is first softened by maceration in water; thence three-fourths of the quantity in preparation is distilled with mixed spirit and water, and the remaining fourth is macerated in a proportion of this distilled for two or three days; the tincture is strained off and expressed and added to the original distilled Curacoa spirit. The flavor of Curacoa is improved by the addition of about one per cent. of Jamaica rum. The

centre of the Maraschino trade is at Zara, in Dalmatia. Genuine Maraschino is prepared from a variety of cherry—the Marasca—peculiar to the Dalmatian mountain regions. The juice of the cherry, fermented and distilled, yields the spirit, which is flavored with the broken cherry kernals themselves. Imitations of Maraschino are easily prepared, a praiseworthy liqueur resulting from raspberry juice, bitter almonds and orange-flower water. In the preparation of Allasch—which is a rich Kummel—bitter almonds, staranise, angelica root, Florentine iris root, and orange peel, are used in addition to caraway seeds. Gold-water and silver-water are liqueurs to which small quantities of powdered gold-leaf and silver-leaf have been added, on account of their lustre. They are now little used. Gentian root is the fundamental "bitter" in most of the preparations known as "Bitters." These compounds, prepared by maceration, are very various in their constitution. The following list includes the names of the principal commercial liqueurs not already named: Noyeau (white and pink), Trappistine (yellow and green), (from the Abbey de la Grace Dieu), Benedictine (from Fecamp), peppermint liqueur, French cherry brandy or kirsebaer (from Copenhagen), mandarine, parfait armour, creme de vanille, creme de rose, the, cafe, menthe, cacao, vanille, pomeranzen, ratafia (from Dantzic), anisette (from Amsterdam and Bordeaux), kirschinwasser (from Switzerland and the "Black Forest"), absinthe and vermouth. Also blackberry brandy. So much trash has been sold under this latter name that it becomes necessary to state what blackberry brandy really is, or should be. The virtues of the bark, root and fruit of the blackberry as a tonic, and strong astringent, have long been known, and the rubus villosus, the botanical name of the blackberry, appears among the official remedies of the United States Parharmacopœia. There it is highly recommended as a tonic and astringent in diarrhoea, either in the form of a simple decoction or syrup. In these forms, however, it is often unpleasant and sometimes impossible to administer it; hence it becomes necessary to prepare it in a form where it is easy and pleasant to take, and in which it can be preserved for an indefinite period. If in this form all the advantages of the decoction and syrup can be combined with a new remedial agent of equal value, we possess in one a very powerful, ever reliable and palatable remedy for this most common camplaint, which, if neglected, may lead to very serious trouble. It may also readily be seen, that in a mixture of this kind a very wide door is opened for sophistication, which, in fact, is the case in the manufacture of so-called blackberry brandy more than any other preparation of this nature. Poor French spirits, colored, sweetened and flavored with chemicals, is what is most generally sold to the public, and when used, aggravates instead of curing the ailment for which it is taken. In a preparation of this kind, it is not proper to publish in full the exact manner of preparation, because unscrupulous competitors are ever ready to take advantage of the least hint to attain their own sinister ends. This article, as made by Rheinstrom Brothers, of Cincinnati, and called Mother Putnam's Blackberry Cordial, is composed of the medicinal principle of the blackberry, rock candy syrup and pure brandy; distilled from the grape, the coloring matter is natural and not artificial, the sugar the very best crystallized cane sugar, and the brandy free from any heavy fusel oils. In one word, this blackberry brandy can be recommended as a pure, unadulterated, palatable preparation, which will yield all the effects claimed by the profession for the blackberry. The consumption of liqueurs is much larger than is supposed. They are used by invalids and convalescents, by ladies and children, but chiefly by society people. Their annual sale is among the millions. Too many liqueurs, owing to competition and to the belief that the public cannot discriminate between a good and bad article, are made from low grade high wines, cheap flavoring ethers and glucose. There are maraschinos in the American market which never knew a cherry, but are made from hydrocyanic compounds, and there are noyeaus which are manufactured directly from nitro-benzole. The United States, of late years, have become large manufacturers of liqueurs; or rather, one firm, the Messrs. Rheinstrom Brothers, of Cincinnati, has. They make curacoa, maraschino, chartreuse, anisette, kummel, chocolate, tea, coffee, raspberry, ginger, peppermint, currant, blackberry, apricot, vanilla, and wild cherry. A careful examination of their goods shows them to be made from the refined spirits of American grain, the best cane sugar and genuine herbs, fruits and roots, and are all distilled by them, not compounded from essential oils. They are offered to the public as American goods, and are labeled as such. It is almost needless for the AMERICAN ANALYST to endorse their work, as they have received medals and honorable mentions numberless at the great expositions of San Francisco, New Orleans, Cincinnati and elsewhere. Their output equals that of the best manufactories of France and Germany, and it is infinitely superior to the average imported liqueurs. Of their seventeen liqueurs, many will be new to the public. Unlike most new things, they are good. The apricot, currant, wild cherry and raspberry are especially noteworthy. They are simply perfect extracts of the fruits. No liqueurs nor cordials made to-day can compare with them in finish, delicacy and naturalness. The French and German liqueurs from the same fruits are far inferior. To those who prefer natural fruit flavors to complex artificial ones, they will supply a long felt want. Those who enjoy delectable summer beverages cannot do better than follow the example set by polite society in Europe. The ingredients are broken ice and any one of the following liqueurs: kummel, anisette, raspberry, currant, blackberry, coffee, chocolate, and apricot. The results may well be called frozen flavors. To make them, fill a tumbler with finely cracked ice and pour over it a large wineglass of your favorite liqueur. Stir with a spoon until it is thoroughly chilled, and the nectar is ready. The slight amount of water softens the liqueur, and the intense cold converts it into a most delicious and refreshing drink. In conclusion, it may be well to recommend to our readers the substitution of a pousse-cafe for the post-prandial brandy or coffee and cognac. A well made pousse-cafe is a work of art. Its succession of flavors delights the palate, its medicinal virtues assist digestion, and its play of colors is an ornament to the table and a delight to the eye. A pousse-cafe is a drink composed of a series of liqueurs arranged in horizontal layers. To make it properly, take a lily-shaped wine-glass and pour into it a half-inch of currant liqueur. Then carefully pour on this, interposing the back of a teaspoon to prevent the momentum of the liqueur breaking the layers, anisette, red curacoa, yellow chartreuse, green chartreuse, and cognac. If properly done, your glass will be six-storied in color, dark scarlet, white, crimson, golden yellow, delicate green and bronze. Nothing remains but to drink that best of all after-dinner drinks, and to thank Heaven for the Rhinestroms and their American liqueurs. It is but fair to add that Messrs. Rheinstrom Brothers are the largest manufacturers of liqueurs, cordials, and bitters in the United States, and that they have created this enormous business by conscientiously furnishing just what they claim and making all their goods just as good as they can be made direct from the best and choicest materials and not from essential oils, and properly ageing all their products. Every liqueur is improved by ageing, as it gives nature a chance to thoroughly blend all the ingredients so that no one flavor may predominate over another. The firm occupies a five-story structure, running from 54 to 62 East 3rd street, Cincinnati, and every part of this immense structure is freely open to public inspection, there being no sophisticating secrets to be hidden. An experience of from fifteen to thirty years of the different members of the firm, and a corps of tried, faithful, experienced employees enables the firm to accomplish this.

Subscriptions $1 per year. Now is the time to subscribe.

BUSINESS NOTES.

Y. P. M. WHISKEY.

The Alexander Young's Company, of Philadelphia, are meeting with such success in the sale of their celebrated Y. P. M. whiskey that they have been compelled to largely increase their distillery and warehouse capacity and have just completed a large and commodious new bonded warehouse at 616 to 622 Charles Street. This, in addition to their free warehouse at 402 and 404 South Street, malthouse at 418 to 422 South Street, the distillery at 408 to 416 South Street and the large and commodious offices and sales-rooms at 700–702 Passyunk Avenue, gives plenty of room for their business. Their whiskey is largely used in private families and clubs, and prescribed with confidence by physicians, because they know what an excellent article it is. The essentials of a whiskey for such purposes are age and purity. Of this consumers are assured, as it is distilled from carefully selected wheat or rye, has constant expert surveillance during all processes of manufacture, and is not permitted on the market until the age specified on the label is complied with.

HORSFORD'S ACID PHOSPHATE

MAKES DELICIOUS LEMONADE.

A teaspoonful added to a glass of hot or cold water, and sweetened to the taste, will be found refreshing and invigorating. Dr. M. W. GRAY, Cave Spring, Ga., says: "I have used it with perfect success in habitual sick headache."

CURLYQUEUE.

The belle of the ball came into the hall with her hair in billowy curls. After dancing an hour and sweating a power, 'twas as straight as a Choctaw girl's. It had been papered for days, had been gummed *a la glaize*, but it didn't take long to undo it. Between me and you, had she used Curlyqueue, she wouldn't have had to rue it. Curliqueue manufactured only by H. S. Johnson, Suffern, N. Y., will keep the hair in curl during the dampest weather, and in the hottest ballroom. See advertisement in this number.

ELECTRICAL MUSIC.—An employe in the office of the architect of the Capitol, Washington, has invented an electric musical machine. The keyboard is similar to that of an ordinary typewriter, and its keys are connected electrically with a number of electric bells arranged beneath the table. Pressure on each key closes the circuit of an electric bell, and when the keys are operated by an expert any tune may be played on the machine.

TO DESTROY INSECTS.—Attention was recently directed to a proposal to destroy insects by luring them against a charged cage within which is an intense electric lamp, the shock from the bars killing them. A well-known industrial organ, in commenting editorially on this idea, makes the statement that at Durham, N. C., since the city has had electrical illumination the ravages of the tobacco worm have been greatly reduced. It suggests that a powerful electric light in the centre of one of the sea islands growing the famous long staple cotton might save all the plantations surrounding it from the destruction so frequently wrought by the cotton army worm.

SMALL HOUSES.—Small houses are going up in great numbers in the upper part of this city. They are sixteen and eighteen feet front, and are designed for small families. The rents run all the way from $700 to $1,200 a year, and the houses are, in the main, finished in hard wood and supplied with modern conveniences. They are a good deal on the style of the small dwellings of Philadelphia and Boston. Real estate speculators claim now that there is more money in these small houses, where the taxes are kept down, than there is in the big apartment houses in the highly taxed and expensive districts.

A New Medicine.—Camphoric acid is a substance that has been introduced very recently into medicine. It is a crystalline body, forming colorless, needle-like crystals, it is difficultly soluble in water, but dissolves freely in alcohol and ether. It is recommended for external application in the treatment of chronic diseases of the larynx, throat, and nose, and is administered in solutions of 1 per cent. or more in weak spirit.

Criminal Hypnotism.—As regards experimental hypnotism as practiced by the laity, it is time its dangers were fully understood and a complete halt therein called, enforced, if need be, by stringent statutory enactment. To endanger health, or to rob one of his or her mental status, is certainly as criminal as the picking of a pocket or an assault upon the person.—*Medical Age.*

"Milk too Dry."—It is a mistake to suppose that because milk is a liquid food it is at the same time a drink which is capable of satisfying the thirst of infants. Although milk appeases hunger, it makes thirst more intense after it has remained some time in the stomach and digestion of it has begun. It is thirst which causes healthy breast-nourished infants to cry for long periods of time, in many instances. There are many cases of indigestion due to weakness or insufficiency of the child's gastric juice which would be greatly benefited, or even cured, if the child were allowed an occasional drink of water.—*Pacific Health Journal.*

For "Black and Blue."—To prevent the blood from settling under a bruise, there is nothing to compare with the tincture or a strong infusion of capsicum annuum mixed with an equal bulk of mucilage of gum arabic, and with the addition of a few drops of glycerin. This should be painted all over the surface with a camel's-hair pencil and allowed to dry on, a second or third coating being applied as soon as the first is dry. If done as soon as the injury is inflicted, this treatment will invariably prevent the blackening of the bruised tissue. The same remedy has no equal in rheumatic stiff neck.—*St. Louis Polyclinic.*

Punctuation.—It is strange that the use of points for purposes of punctuation should be such a comparatively modern invention. Of the four generally used points only the period (.) dates earlier than the fifteenth century. The colon (:) is said to have been first introduced about 1485, the comma (,) some 35 years later, and the semi-colon (;) about 1570.

Always Blooming.—Window plants may be grown any season of the year in the following manner: Soak a large piece of coarse sponge in water, squeeze half dry, and sprinkle in the openings red clover seed, millet, barley, grass, rice and oats. Hang it in the window where the sun shines a portion of the day, and sprinkle daily with water. It will soon form a mass of living green where even the clover will bloom.

Chicken Figures.—The chicken business is a matter of wonderful importance to the table comfort and the financial outlook of the American farmer. Government statistics show that the annual expenditure in this line is $560,000,000; and, despite the immense production of eggs, several million dollars' worth are annually imported to meet the deficiency of the home supply.

Bread Buttering Machine.—One of the latest and most unique inventions is a machine for buttering bread. It is used in connection with a patent bread cutter, and is intended for use in prisons, workhouses and other reformatory institutions. There is a cylindrical-shaped brush which is fed with butter, and lays a thin layer on the bread as it comes from the cutter. The machine can be worked by hand, steam or electricity, and has a capacity of cutting and buttering 750 loaves of bread an hour. The saving of butter and of bread and the decrease in the quantity of crumbs is said to be very large.

The Transportation of Acids.—There has been patented in Germany a process by means of which sulphuric acid for manufacturing purposes can be safely transported. The inventor takes advantage of a property of certain salts,—of which alkaline sulphates are representatives,—by which they give up their water of crystallization when heated, and take it up again when cool; and he does so by mixing the salts in an anhydrous condition with a calculated quantity of sulphuric acid. The whole mass becomes granular, or may be formed into cakes, and, when heated the whole liquifies, and may be used as if it were sulphuric acid, for the presence of bisulphate of soda does no harm.

Varnish for Confectionery.—Take half a pound or more of gum benzoine; put it into a bottle and cover it with fourth proof alcohol; cork up tightly and let it digest for at least two weeks, shaking up once or twice a day. After which time you may pour gently off any quantity you may require for present use. It should be the thickness of thin syrup; if used too thick, it is apt to appear in streaks on the work when dry; if too thick, dilute it with alcohol. This varnish is perfectly harmless and very fragrant, resembling somewhat the odor of vanilla. It will also keep for years, growing better with age. It is a nice varnish for all kinds of chocolate work and candies; pulled and clear. It forms, when dry, a thin, glossy film or skin over them, which prevents the access of the moisture of the surrounding atmosphere, and tends to keep them from becoming sticky for a much longer period of time.—*British Confectioner.*

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CONTENTS.

OATMEAL AGAIN.

In the AMERICAN ANALYST for April 3d we called attention to the imposition practised by several manufacturers in offering to the public oatmeal claimed to be so prepared in manufacturing that it can be cooked in from three to five minutes. We then showed that this is impossible, and that to eat such half or quarter cooked oatmeal was dangerous to health, if not to life. As usual, when we publish any article of this kind, the parties who are interested in the goods mentioned, immediately began to inundate us with correspondence, calculated to impress us and, if possible, our readers, that, like the proverbial malaria and mosquito, the evil criticised had no relation to the particular brand of goods manufactured by them, but their competitors were the ones, and we had justly described them. These letters are all cunningly worded, so that if we were to publish them they would be a splendid free advertisement for the writers. We do not run this journal on that principle, and therefore the scheme failed. We have no controversy with these people; we merely desired to impress upon our readers that there is no process known by which oatmeal can be so prepared in manufacture as to be convertible by three or five minutes' cooking into wholesome food for any one, much less for children. We have no preferences, and, in fact, do not know the makers of the different brands. One manufacturer claims that he not only has the exclusive patent for the process of steam cooking oats, but that this patent gives him the sole right to call his product "steam cooked," and that all others are infringers. Another claims that he is the original Jacobs, while they severally insist that their peculiar process is the only good one, even though some admit that their oats are not cooked at all. One prominent wholesale grocer goes so far even as to put up crushed raw oats, and in his directions on the wrapper warrants his oats to cook ready for the table in three minutes. Be this as it may, we confidently advise our readers, as they value the health of their children, to beware of these three to five minute oatmeal snares. There are pounds of indigestion in every ounce of them. We are ready to prove this if any proof is needed. Every physician and cook will readily endorse what we have said, and so long as there is any doubt about the quality of any one of these oatmeals, it would be safest to buy the old-fashioned kind and cook it at least one hour, or, what is still better, until a competent cook says it is done.

MANUFACTURERS AND THE CENSUS.

The attention of the AMERICAN ANALYST has been called by the Hon. Robert P. Porter, Superintendent of the Eleventh Census, to the fact that on the 2d day of June the work of collecting statistics of manufactures will be inaugurated throughout the entire country. The value of this report must depend wholly upon the accuracy and thoroughness with which manufacturers answer the questions propounded. The personal interests of every manufacturer are involved in the character of the report on manufactures. It will be quoted for the next ten years as the official announcement of the exact industrial condition of the country, and will be the basis for any future legislation that may be enacted in regard to the wants of our people, whether engaged in agricultural or mechanical pursuits. Therefore it is of vital importance to each manufacturer that an accurate report shall be made. The Superintendent of Census has taken every possible precaution in the preliminary work to make this census complete and satisfactory, and the earnest co-operation of those engaged in productive industry is all that is now necessary to secure valuable results. Every manufacturer should bear in mind that his answers to the questions relating to his business are held strictly confidential, are not disclosed to any competitor or to other persons, and are not used by the Government as predicate for the purposes of taxation or license, or in any way to adversely affect his individual business. This assurance is printed on each schedule over the signature of the Superintendent of Census. The expert Special Agent in charge of this branch of census work, Mr. Frank R. Williams, has personally visited the principal manufacturing centres and consulted representative manufacturers, the publishers of trade journals, and practical business men generally, for the purpose of ascertaining the proper scope of the inquiry for each branch of manufacture. The questions contained in the census schedules are those suggested by the manufacturers and other persons most interested in the progress of the country, and cover ground absolutely essential to the proper presentation of its industrial conditions and resources.

BOGUS JAM.

As the cider-making season approaches there is a remarkable increase of bustle among jam makers. It is strange, but true. There may not be any connection apparent between these two industries, yet there is a very strong one. Cider makers furnish all the fruit the large majority of jam makers use in the manufacture of all the raspberry, currant, quince, peach, plum and pineapple jam or fruit butter they make. The pomace, or that part of the apple which is left after having been through the cider press, and which of course is in a state of decay, is bought up by these fruit butter men, boiled, sweetened, colored, frequently with arsenical aniline colors, and flavored with poisonous flavoring chemicals, to suit whatever label is to be put on the package. It is such trash as this that may be found at all cheap grocers, and which, because it seems to be cheap, has an enormous sale among the poor, to largely add to the infantile diseases and death list. Where is the Board of Health?

ICE AND BACTERIA.

The question of ice-pollution, which the AMERICAN ANALYST set into agitation about two years ago, is still attracting the attention of sanitary authorities. We have just received an abstract of a report on that subject made May 12 to the Massachusetts Legislature by the Board of Health of that State, which in condensed form is as follows: The Board received replies to its circulars of inquiry from 189 cities and towns, and the sources of pollution were noted in twenty-five cases, but no illness could be definitely connected with the use of the ice taken from those sources. Samples of ice from twelve of the most polluted sources, which were analyzed and compared with water from the same ponds, showed that in the ice the color and salt had been removed, and all but about 13 per cent. of the other impurities noted in the water. The examinations indicated that different parts of a cake may differ much in quality, especially as regards the number of bacteria. From these and other samples it appears probable that a considerable part of the impurity in water near the

surface is entangled in the first inch or less of ice. If snow falls upon new ice, causing it to sink, the snow-ice thus formed will freeze without purification. The method often pursued of flooding the ice of a pond or river by cutting holes gives a layer of ice as impure as the water of which it is formed. The purifying effect of freezing is greater upon substances held in solution than in suspension. As an average of all the tests, the organic impurities of snow-ice amount to 69 per cent. of those of the waters, those of ordinary ice 12 per cent., and of clear ice 6 per cent.; bacteria, 81 per cent. in snow ice, 10 in ordinary, and 2 in clear ice. The Board warns the public against using ice made by flooding.

A DANGEROUS PRESSURE.

A Congressional committee has been for some time past engaged in investigating the characteristics of the immigrants who are at present flocking to this country. The reports of the committee, so far as they have been published, show that the United States are receiving a very undesirable class of transatlantic citizens. Italians are coming over in large numbers wholly destitute, without money or any clothes except those they wear. They are practically peoned to Italian bankers, who pay their passage to this country, find them employment and provide them shelter in an Italian quarter which is strictly secluded from American invasion. They keep up the practices and customs of their home country, and after years are found to have adopted none of the American ideas or modes of life. They do not assimilate, and apparently have no intention of becoming American citizens. If possible, they are more exclusive than the Chinese, and according to all reports less desirable as immigrants. Complaint is made that on the whole the quality of immigration is steadily deteriorating. The percentage of Germans and Swedes is decreasing, while the number of Italian and Hungarian immigrants is on the increase.

A CINNAMON FRAUD.

Concerning the wily operations of the notorious sharps who prey upon farmers, the Tiffin, O., *Tribune* relates the following particulars of a new scheme which is being industriously prosecuted in Ohio: A new swindling scheme is being operated in many counties of the State by part of the Bohemian oats gang which has just come to light. Susceptible farmers are sold cinnamon beans, which have wonderfully reputed qualities as producers of cinnamon oil, at $20 a bushel. The sellers give a bond agreeing to give the farmers $5 each for every tree grown from the beans to a height of four feet. The beans are nothing but common red food beans, perfumed and saturated with cinnamon oil, and the stalks from them will never grow more than six inches high, hence the farmer never realizes on his bond.

PRECISELY THE POINT.

Mr. Joseph Howard, in the New York *Press* of May 13, says: "The AMERICAN ANALYST makes a very good point, that 'when oleomargarine is labeled and sold as such, the buyer is not deceived nor injured, the article being wholesome; when, however, it is sold as butter, a fraud is perpetrated.' That's common sense, and therefore stands."

The military commission of the Austrian army have established a law that the offense of intoxication should be punished the first time by a public reprimand; the second offense by several days' imprisonment in the guard house. The third offense is evidence that the victim is suffering from a chronic disease, and he is placed under constant surveillance. His pay is taken out of his hands, and every means used to prevent him from getting money to secure spirits.

FOUR NEW ACADEMICIANS.

BY MARCUS BENJAMIN, PH. D.

Each year the National Academy of Sciences holds two sessions, but it is only at the so-called stated session that members are elected. The mortality of the Academy during 1889 was unusually large. The distinguished Dalton, eminent for his teachings of physiology, died in February. He was the first in this country to illustrate his lectures with experiments performed on living animals. His "Treatise of Human Physiology," was accepted authority and passed through seven editions. By his death the presidency of the College of Physicians and Surgeons in New York City became vacant. Towards the end of April the versatile Barnard passed away. Gifted as a physicist, as an educator, and as a writer, his presidency of Columbia College for nearly a quarter of a century conferred upon him a fame worthy of his great ability. The death of Elias Loomis followed next in August, in New Haven—quiet and alone he died. No one in this country was more able than he in the science of meteorology, and his text-books on higher mathematics have made his name known in every school and college where that subject is taught. The state geologist of New Jersey, George Hammell Cook, who excelled in agriculture, chemistry, geology, and natural history, passed away in September. At the time of his death he was filling the chair of geology and agriculture in Rutgers College, of which institution he was also vice-president. He, more than anyone else, was active in developing the natural resources of New Jersey. In October, Leo Lesquereux, of Columbus, Ohio, died. He came to this country with Louis Agassiz, and as an authority on fossil botany, stood foremost in the United States. His studies of the coal formations of Ohio, Pennsylvania, Illinois, Kentucky and Arkansas are classic.

It was as successors to these most eminent scientists that the Academy chose at its recent meeting: Gen. Thomas L. Casey, Russell H. Chittenden, George L. Goodale, and Richmond M. Smith, of each of whom a brief notice is herewith given.

Thomas Lincoln Casey is the son of Gen. Silas Casey, who served in the Mexican war and with the army of the Potomac during the Civil War, and was born in Madison Barracks, Sackett's Harbor, N. Y., on May 10, 1831. He was graduated at the U. S. Military Academy in 1852 among the first in his class, and served there as assistant professor of engineering during 1854-59. Meanwhile he had been promoted first lieutenant in the engineer corps, and at the close of his service at West Point in 1859 he was assigned to the command of the engineers then serving on the Pacific coast. During the Civil War he was staff engineer at Fortress Monroe, Va., and then had charge of the permanent defences and field fortifications upon the coast of Maine. His active service at the front was limited, but he served on special duty during the first expedition to Fort Fisher in December, 1864. He was promoted to major in October, 1863, and at the close of the war received the brevets of lieutenant-colonel and colonel. Subsequently he was engaged in the various duties of an engineer officer, and in 1877 he was placed in charge of the public buildings and grounds in the District of Columbia, including the Washington Aqueduct, and the construction of the buildings for the state, war and navy departments which were finished by him in 1888. Perhaps his best known work is the completion of the Washington Monument. After years of inaction it was finally determined to complete this obelisk, the corner stone of which was laid in 1848, and Col. Casey was given charge of it in 1878. He successfully completed the work in 1884, and it now stands in Washington, 555 feet high, without its equal in height on this continent. In November, 1886, he became president of the Board of Engineers in New York City, under whose direction the great national engineering improvements are being conducted by means of which the Harlem River is to be made into a ship canal. His present appointment of chief of engineers with the rank of brigadier-general came to him in July, 1888, when he succeeded Gen. James C. Duane to that high office, in which, since its establishment, he has had but six predecessors. Col. Casey is the third generation of the family to graduate from the U. S. Military Academy, and like his father, whose full name he bears, is an officer in the engineers. Of the engineers who have been elected members of the National Academy, Bache, Barnard, Humphreys, Mahan, Totten and Warren are dead, but Abbott, Bartlett, Comstock, Meigs, Newton and Trowbridge still survive.

From engineering to chemistry the distance is great, but is necessary for the Academy to have the foremost representatives of each science among its members, and therefore it choose Russell Henry Chittenden. This scientist was born in New Haven, Conn., on February 18, 1856. He was graduated at the Sheffield Scientific School of Yale in 1875, and then spent some time in pursuing higher studies at the University of Heidelburg, Germany. He returned to New Haven in 1876 to accept the post of instructor in chemistry at his *alma mater*, and in 1882 was made full professor of physiological chemistry there, having meanwhile, in 1880, received the degree of Doctor of Philosophy for his original investigations in the domain of physiological chemistry. The results of his numerous researches have been given to the world in papers which have been published in the *American Chemical Journal*, the *Journal of Physiology*, *Zeitschrift fur Biologie* and similar periodicals, besides which he has edited several volumes of "Studies from the Laboratory of Physiological Chemistry" of the Sheffield Scientific School of Yale College, "consisting chiefly of papers reprinted from the *Transactions of the Connecticut Academy of Science*." Prof. Chittenden has been frequently called upon to testify as an expert in important criminal cases. He is a member of several scientific societies, and is a worthy successor to the place made vacant by the death of Dr. Dalton.

While it is true that no exact successor to a member of the academy is ever chosen, still an effort is made to preserve a full complement of specialists and so as Lesquereux was to a certain extent a botanist, it was not unnatural that among the new members a botanist should be found. George Lincoln Goodale was born in Saco, Me., on August 3, 1839. After graduating at Amherst College in 1860, he studied medicine and received his degree from both Harvard and Bowdoin in 1863. He began his practice in Portland, Me., and became at the same time instructor of anatomy in the Portland School for Medical Instruction; also, in 1864, he was appointed State Assayer of Maine. In 1867 he was called to the chair of natural science and applied chemistry in Bowdoin College, and a year later became professor of materia medica in the Medical School of Maine, and also a member of the State Board of Agriculture. All of these various connections he resigned in 1872, and went to Harvard College, where he became instructor in botany and University lecturer on vegetable physiology. Thenceforth his name has been associated with the botanical work at that great university. In 1873 he became assistant professor of vegetable physiology, in 1878 professor of botany, and in 1879 director of the Botanical Garden. On the death of Asa Gray, in 1888, he succeeded that distinguished scientist as Fisher professor of natural history in Harvard University, which chair he still holds. He is also a member of the Council of Harvard College Library, and since 1881 he has been a member of the Faculty of the Museum of Comparative Zoology. Dr. Goodale is the author of "Wild Flowers of North America" (1882), "Vegetable Physiology" (1885), and "Vegetable Histology" (1885). The two last named, with additional matter, have been combined under the title of "Physiological Botany" to form the second volume of Asa Gray's "Botanical Text Book" (1885). Prof. Goodale is a member of several scientific societies. He is now in Europe, but will return soon, and during the summer

will preside over the meeting of the American Association for the Advancement of Science, of which he is President-elect.

The remaining new academician is Richmond Mayo Smith, who was born in Troy, Ohio, on February 9, 1854. After graduating at Amherst College in 1875, he spent some time in study abroad, but returned in 1877 to accept the appointment of tutor in history at Columbia College. He was made adjunct professor of history and political economy in 1878, and five years later was promoted to the full professorship of political economy and social science, which chair he still holds. Prof. Smith, besides his duties in connection with the School of Letters, is also a member of the Faculty of the School of Political Science. He takes high rank among the men that have come to the new Columbia, and his views on political science are regarded as high authority. He is an honorary member of the Academy of Political Science and a member of the American Economic Association, to whose publications he contributed in 1888 a valuable paper on "Statistics and Economics." His only other publication in book form is 'Emigration and Immigration" (1890). Prof. Smith is a tall, slender man, and is a frequent attendant at the meetings of the Authors' Club in this city, of which he is a member.

There is still a single vacancy in the National Academy, but as there were several candidates it was deemed best to wait until another year had elapsed before any one else should be chosen.

THE MODERN PIANO.

ITS GENESIS, DEVELOPMENT AND STATISTICS OF MANUFACTURE.

Who that hears Joseffy or Rubenstein evoke perfect music from the magnificent piano of to-day realizes the long growth of that noble instrument from clumsy and simple forms, the amount of thought and work that has been expended upon every part thereof and every stage of its development, the numberless inventions, discoveries, studies and researches it represents—the capital invested, the labor employed, the fierce competition of rival makers, the marvellous utilization of science, art, commerce and manufacture? The piano is an embodiment of modern life—the symbol of the latter part of the nineteenth century. Its history during the nine hundred years in which it has pleased the passing generations of men is the history of European civilization. Its birth-place and natal year have long been lost. Even the names of its parents are forgotten. Somewhere in the south of France, about the year 927, some ingenious artisan whose soul in leisure hours went out to music, conceived the notion of producing notes by the mechanical action of keys. Before that time the itinerant musician had twanged the harp with fingers whose tips had become leather-like from long use, or had blown the pipes until his cheeks wore into holes like those of luckless bottle makers in the overworked and heartless glass houses of to-day. The archaic inventor called his primitive box an *organum*, from which is of course derived our modern word and fact, organ. It was a very simple apparatus so far as can be ascertained, being a box containing a lot of pipes, a bellows and a series of plungers or draw stops which admitted or shut out the air from the resonant tubes. From the "organum" thus brought into being sprang the organistrum, a stringed instrument of three strings which sounded simultaneously upon a revolving drum. This clumsy invention became at once exceedingly popular, and although its music is from the standards of to-day of the lowest and most barbarous type, it still keeps some hold upon the public heart and in the familiar form of the hurdy-gurdy is widely used and admired by the masses of England and the Continent. The inventive spirit was not very active in those years. Nothing seems to have been done in the development of keyed stringed instruments until the fifteenth century (probably A. D. 1402), when the primitive clavichord was produced. This seems to have been a sounding box in which eight catgut strings were stretched and struck by wooden hammers or stoppers. In the following century the piano had grown in every way. It now contained a key board with irregularly alternating black and white keys to indicate the notation, a short sounding board and a set of strings, arranged in pairs. The clavichord was followed by the manichord or manicorde. The damper in this curious instrument was a cloth braid around the wires just beyond the strikers. The cloth deadened the tone, and the instrument was soon known as the "dumb spinet." It had a compass of three octaves and a third and allowed considerable scope to the musician. Close upon the "dumb spinet" came the virginal and the clavicymbalum or ordinary spinet. The three arranged the wires in irregular triangular form, issued one string where two and three had been formerly employed and used tangents which would be recognized to-day. The strings were very short and the music produced must have been about half way between that of a zither and a mandolin. At this time (the sixteenth century) the form of the instrument displayed great variety. Trapezoids, rectangles, trapezial ovals, pentagons and heptagons are still preserved in the great museums of Europe. A series of slight improvements converted the spinet into a harpichord or harpsichord, when the instrument was horizontal, or a claviciter, when vertical, like the modern upright piano. It is well to bear in mind that these words were used with but little accuracy, the same instrument being frequently referred to under several different titles. In the seventeenth century the art of making had so far progressed that the harpsichord was a large powerful and delightful instrument. In the eighteenth century Bartolommeo Cristofori produced what he called "pianoforte gravecembali" in English, a soft-strong harpsichord. This is the origin of both the modern name and instrument. The Italian makes was closely followed by a number of skilful German mechanics, who culminated in Stein of Augsbury, and J. S. Streicher of Stuttgart. They improved upon Cristofori's model and produced a piano that was strongly made of wood, possessed of great power, but was slow, heavy and hard to strike. The nineteenth century opened with great inventors at work upon the piano in all the leading lands. In England John Broadwood and Robert Stoddart; in Germany John Greib; in France Louis Petzold, Sebastian Erard and Pierre Erard, and in America John I. Hawkins were the originators of over two hundred improvements. The last named was the most brilliant and prolific of all the set, so much so that he may be truly called the father of the piano. The progress since their time has been more in details than in principles. The highest scientific and mechanical skill has been employed, and what may be called perfect instruments have been the result. In this work America has done two-thirds of all that is worth recording. Conrad Meyer in Philadelphia, Jonas Chickering in Boston, Henry Steinway in New York are the three great names between 1820 and 1860. To-day the industry is one of the great industries of the world. The chief centres of the pianoforte trade are London, Paris, Berlin, Leipsic, Dresden, Stuttgart, Hamburg, Vienna, St. Petersburg, Brussels, New York, Boston and Baltimore. The greatest centralizations are found in London and Paris, very few pianofortes being made in the United Kingdom or France, excepting perhaps at Marseilles, out of those cities. But in Germany and the United States there are many pianoforte makers in many towns besides those we have named. Pianofortes are made in Italy at Turin, Milan, Florence, Naples and Palermo, and in Spain at Barcelona (principally), Madrid and Saragossa. The large export trade belonged formerly to England and France, but it has been weakened of late years by the commercial activity of the Germans, who have besides copied successfully and with the advantage of much lower wages recent American models. German pianofortes are now extensively found in Great Britain, where free trade has favored their introduction and in the Australian colonies; they have also outrivalled the French in Holland, but we believe France still keeps the trade of southern Europe, as the United States mainly supply Canada. English exports of good makers will be found all over the world, but some important markets have been lost through the inferior instruments consigned or sold because they were cheap and were supposed to be good enough. The United States and Germany appear to employ the greatest number of workmen in the pianoforte handicraft, Germany producing the largest number of instruments. In adopting, however, the statistics given, we must not forget to take into account that custom of advertising which leavens nearly every statement. There are said to be upwards of 8,000 workmen employed in piano making in America. Good authorities claim for America an annual production of about 40 000 pianofortes of all kinds. We hardly feel disposed to allow Germany 73,000, with a less number of workmen, viz.: 7,834, but such is the statement put forward, it is said, by a semi-official source, the *Deutsche Consulate Zeitung*. It must be borne in mind that machinery adds its power indefinitely to the number of men employed, but this occurs more in America than in Germany, and Americans turn out better work to which more tone is given. A recent strike in Paris represented the pianoforte trade society as consisting of 5,000 members; and we shall not be far out in crediting that city with a production of 20,000 instruments yearly. The number made in London annually may be taken as reaching at least 35,000. Having thus given the history and statistics of the pianoforte we will now endeavor to tell the reader what a well-made piano should be, and give some hints as to the causes of the great differenc in prices and how to buy a piano.

SUBSTITUTE FOR JUTE.—About six months ago a young lawyer in Augusta, Ga., began experiments with cotton stalks. The pulp and skin were removed from the stalks. The fiber was then placed in a carding machine from which was secured an article of the tenacity and color of jute butt yank. This product he shipped to himself at Paterson, N. J., where it was woven into a bagging that is said to be less inflammable than jute, and while equally durable, is of less cost. Cotton planters are jubilant over the discovery, and while they see an article in view that will help them to boycott jute bagging, they also see a profitable market for cotton stalks, which they have always had trouble to dispose of.

MILK POWDER.—Milk in a powdered form, convenient for keeping and transportation, is now sold in Germany, and is prepared as follows: A mixture of skimmed and whole milk is evaporated over a uniform fire to the consistency of the condensed article. Sufficient grape sugar is then added to make it a crumbly mass and reduce its temperature to 20 degs. or 30 degs C., the color at the same time changing from brown to white. The mass when cool is ground in a mill or cut into cubes, and can be bought in either form. It has been shown by tests that this desiccated milk is unaffected by a damp atmosphere or a high degree of heat.

CLOSE SHAVING.—To make the skin perfectly smooth requires, not only the removal of the hair, but also a portion of the cuticle, and a close shave means the removal of a layer of skin all around. The blood-vessels thus exposed are not visible to the eye, but under the microscope each little quivering mouth holding a minute blood drop protests against such treatment. The nerve tips are also uncovered and the pores are left unprotected, which makes the skin tender and unhealthy. This sudden exposure of the inner layer of the skin renders a person liable to have colds, hoarseness, and sore throat.—*Medical Classics*.

THE NEW PROFESSION.—A well-known London journalist, realizing the fact that the ordinary professions in England are greatly overcrowded, is having his eldest son educated to be a cook. The boy has been trained by a famous chef at Brussels, and afterward studied under the chef of the Grand Hotel, Paris, and later served for three years to M. Charpentier, chef of the Savoy Hotel, London.

CORRESPONDENCE.

WARNINGS IN DREAMS.

The following communication from Prof. William James, of Harvard University, will, we trust, receive the co-operation of such readers of the AMERICAN ANALYST as are interested in the psychological investigations to which it relates:

CAMBRIDGE, MASS., May 10.

Editors AMERICAN ANALYST: May I ask for the publicity of your pages to aid me in procuring co-operation in a scientific investigation for which I am responsible? I refer to the *Census of Hallucinations*, which was begun several years ago by the "Society for Psychical Research," and of which the International Congress of Experimental Psychology at Paris, last summer, assumed the future responsibility, naming a committee in each country to carry on the work. The object of the enquiry is twofold: First, to get a mass of facts about hallucinations which may serve as a basis for a scientific study of these phenomena; and second, to ascertain approximately the *proportion of persons* who have had such experiences. Until the average frequency of hallucinations in the community is known, it can never be decided whether the so-called "veridical" hallucinations (visions or other "warnings" of the death, etc., of people at a distance) which are so frequently reported, are accidental coincidences or something more. Some eight thousand or more persons in England, France and the United States have already returned answers to the question which heads the census sheets, and which runs as follows: "*Have you ever, when completely awake, had a vivid impression of seeing or being touched by a living being or inanimate object, or of hearing a voice; which impression, so far as you could discover, was not due to any external physical cause?*" The "Congress" hopes that at its next meeting, in England in 1892, as many as 50,000 answers may have been collected. It is obvious that for the purely statistical enquiry, *the answer "No" is as important as the answer "Yes."* I have been appointed to superintend the census in America, and I most earnestly bespeak the co-operation of any among your readers who may be actively interested in the subject. It is clear that very many volunteer canvassers will be needed to secure success. Each census blank contains instructions to the collector, and places for twenty-five names; and especial blanks for the "Yes" cases are furnished in addition. I shall be most happy to supply these blanks to any one who will be good enough to make application for them to

Yours truly,

WM. JAMES.

LUXURY.

THE IMPOSSIBILITY OF RESTRAINING IT BY SUMPTUARY LEGISLATION.

It is related of the wife of a certain Doge that she was so given to luxury as to eat with a golden fork instead of with her fingers. But, the chronicle adds, a punishment from heaven overtook her for this outrage upon nature; she was afflicted with a loathsome disease. A better, though less amusing, illustration of the fact that what was formerly regarded as luxury would not be so regarded now, is to be found in the introduction to Holinshed's *Chronicon*, where there is a bitter complaint of the great number of chimneys that had recently been erected in England, and of the many earthen and tin dishes that had been introduced in place of wooden ones. The word is difficult to define, not so much because it has included different things at different times and places, but because it is hard to draw the line between a luxury and that which is necessary. Anything which simply satisfies one of the three essential wants of man, food, clothing and shelter, may be regarded as a necessary, and whatever is beyond, as a luxury; but no very clear line can be drawn between them. From ancient times the feeling that there might be something wrong in the indulgence in luxury has been very general, probably due in part to the ancient belief that the gods were jealous of men's good fortune, and partly to the influence of Chistian asceticism. One of the chief uses of luxury has been to accentuate class distinctions. The minute governmental regulations prescribing what luxuries are permitted to each rank afford abundant evidence. Thus the popular notion of a connection between wealth and luxury has a basis in addition to the obvious one that the former affords the means of procuring the latter. Among barbarous and semi-civilized peoples, luxurious indulgence is largely confined to special occasions, as feasts and religious festivals, and then the excesses are very great. Of many South American tribes it is stated that when once they begin to drink they do not stop till they fall down senseless, and stories of the savage's capacity for food are very familiar. The eighteenth century belief that people in a low stage of civilization were very temperate turns out to be entirely erroneous. The contrast between the more civilized statas of Europe and the Russians is noticeable. A Russian, it is stated, seldom drinks; but when he does, to the greatest excess. During the middle ages, when industry and commerce were but little developed, ornamental arms and drinking cups were the chief articles of luxury, and in the latter the metal seems usually to have been of more value than the workmanship. What wealth there was being concentrated in the hands of a few, ostentation was mainly confined to keeping a numerous retinue and to entertaining great numbers of guests, at which entertainments the amount of food and drink provided was remarkable, rather than the variety and costliness. For the most perfect examples of luxury in its worst sense we may turn to Rome in the earlier part of the empire, when the whole social fabric was hopelessly diseased. Juvenal's lines upon Montanus occur to one. "No one had greater experience in eating in my time; he was skilled in detecting at the first bite whether oysters were natives of Circeii or the Lucrine rocks, or produced from the depths of Rutupiæ; and he could tell the shore a sea-urchin came from the moment he saw him." The people of fashion were so determined to have the freshest sea fish that they would taste only such as they had seen alive on the table. Flocks of sheep were kept dyed in purple. A custom grew up of dissolving pearls in wine, in imitation of Cleopatra. The actor Aesopus placed before his guests a dish consisting wholly of birds which had been taught to sing or speak. *Hoc est luxuriæ propositum, gaudere perversis*, concludes Seneca. In modern times civilization has consisted largely in bringing what in former ages were luxuries within the reach of the many. Most of what are to us the comforts of life were, in the past, luxuries attainable only by very few. The single article which perhaps typifies the improvements in the food of the masses is bread. "In France in 1700, 33 per cent. of the population were consumers of white bread; in 1760, 40 per cent.; in 1878, 45 per cent.; in 1889, 60 per cent. (*Roscher: Political Economy.*) The improvement in other articles of food as well as in the amount and quality of clothing and in the comfort of dwellings has been no less marked, but it is doubtful whether these improvements can be regarded as luxuries. It is to be noticed, however, that luxury has been chiefly concerned with the table, with clothing, and with fine houses. There is one species of consumption which must be regarded as luxurious, if any species that is common to a whole people can be so regarded, namely: The consumption of tea, coffee, tobacco, and spirituous liquors. With regard to the consumption of the latter, it is suggested that the spirits, beer, and wine, taking the average from 1883 to 1887, cost the consumers a little less than $768,000,000. Of this, the domestic spirits, beer and wine, amounted to $734,000,000, leaving only $34,000,000 to cover the more expensive foreign liquors—less than 5 per cent. That the other articles mentioned are of almost universal use is well known. In the estimation of the ancients, luxury tended toward the enervation of a people, and therefore many sumptuary laws were enacted among them. Those of Lycurgus were among the earliest. No one should own a house or a household article which had been made with an implement finer than an axe or a saw. Spices, except salt and vinegar, were forbidden. Solon aimed some of his laws at the passion of women for dress and jewels. At Rome there were laws regulating the pomp and display at funerals. All the nations of modern Europe have made trial of sumptuary laws. Those of the fourteenth century were directed mainly against expense for furs, and those of the sixteenth against articles of gold and silver. One law of 1228 provided that at weddings there should not be more than twelve plate nor more than three musicians. There seems to have been some connection between sumptuary laws and the theory of protection. Louis XIV. assigned as a justification for certain acts, that the importation of foreign articles of luxury threatened to rob France of all her gold and silver; and the English prohibition of silk hats, caps, stockings, etc., had the intention of promoting the domestic manufacture of wool. There is one instance of the survival of sumptuary laws at the present day, namely: The laws "prohibiting the manufacture and sale of alcoholic liquors." The Greek law-giver, Zaleucos, punished with death the drinking of unmixed wine, unless it was taken by the order of a physician. In the sixteenth century an effort was made to prevent the use of brandy from spreading among the common people. By a Hessian law of 1530, apothecaries only were permitted to retail it. Tobacco, in the next century, met with much legal and ecclesiastical opposition; and still later coffee was prohibited by law. In 1624 a Papal excommunication was fulminated against all who took snuff in church; it does not appear to have been entirely effective, as it was repeated some seventy years later. A Turkish law provided that all smokers should have the pipe broken against their nose. In Russia the penalty for smoking was death. All these articles, however, were permitted to be sold as medicines. After the fruitlessness of the efforts to suppress the use of these luxuries became apparent, governments substituted taxes upon them for prohibition; partly with the hope of restricting their use and partly for purposes of revenue. It has been found that in general the lower the tax the greater the revenue derived from it; so that the accomplishment of the moral end varies inversely as that of the fiscal end. It may also be noted that an excessive tax encourages frauds upon the government. For the last forty years a considerable number of people in this country, a smaller number in England, with much zeal and unlimited ignorance, have been agitating for a return to the sumptuary legislation of the sixteenth, seventeenth and eighteenth centuries. In some of the less advanced states they have succeeded in getting the laws advocated placed upon the statute book or even incorporated in the constitution; but like their prototypes of two or three centuries ago, these laws are not effective. The difficulty of enforcing sumptuary laws results, doubtless, in great measure from the fact that the consumption of wealth is carried on in the secrecy of the home. They are even likely to have the opposite effect to that intended, on the principle that forbidden fruit is most desired. The fear has been felt that a nation might perish by pursuing luxuries so eagerly as to neglect the necessaries of life; but history does not hold out any hope that, if such a case should arise, the government could fulfill the office of saviour. The French government probably made more strenuous efforts than any other to enforce its sumptuary legislation, but all to no purpose.

POISON IN CELERY.—Dr. Charles M. Cresson, of Philadelphia, states that he has more than once found the typhoid bacilli in the juice that he has squeezed out of celery grown near Philadelphia.—*Annals of Hygiene.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

May,

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, catfish, cod, eels, clams, flounder, halibut, herring, lobster, mackerel, mussels, perch, porgie, rock-fish, salmon, shad, shrimp, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Artichokes, beans, carrots, garlic, lettuce, onions, parsley, parsnip, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

JENNIE'S ROLLS.—One and one-half quarts flour, piece lard size of an egg, one-half cup yeast, pinch of salt, one tablespoonful sugar, sufficient cold water to mix thoroughly; work until light, put to rise and form into rolls, rise again and bake.

SALMON ROLL.—One can salmon; remove bones and pick fine; add one-half or one-third as much bread crumbs as fish, salt, pepper, teaspoonful butter, parsley or thyme, juice of lemon, one egg; mould into a roll, smear with yolk of an egg, dust with fine bread or cracker crumbs, cover with buttered paper and bake nearly an hour. Garnish with French peas and serve with caper sauce or mayonnaise.

CLAM TOAST. — Simmer two dozen finely-chopped Little Neck clams thirty minutes in enough hot water to cover them. Beat well two egg yolks, and to them put a dash of cayenne and one-half cup milk or cream; add to the clams. Stir in one-half teaspoon flour in cold milk, add, simmer for a moment or two, pour over thin crisp toast and serve.

CODFISH BALLS.—One teacupful finely-picked codfish, two teacupfuls mashed potatoes (hot). Scald the fish, drain dry, add the potatoes and two eggs, yolks and whites beaten separately. Drop with a large spoon into boiling lard.

HONEYCOMBS.—One cupful molasses, one cupful brown or white sugar, one cupful butter, one cupful flour, one tablespoonful ginger, one tablespoonful cinnamon. Warm sugar, butter and spices together; turn this into the flour, drop small spoonfuls about four inches apart in a buttered pan. Bake in a moderate oven about five or ten minutes, cut in squares, take from the pan, and curl around bottles to cool.

MRS. F'S TOMATO PICKLES.—One peck green tomatoes sliced with six large onions; sprinkle with one teacupful salt, and let stand overnight. In the morning drain throughly, put in a porcelain kettle with two quarts water and one of vinegar, and boil fifteen minutes. Drain, cover with vinegar, add two pounds brown sugar, one-quarter pound whole mustard, two tablespoonfuls cinnamon, two of allspice, cloves and ginger each, and one teaspoonful cayenne pepper. If preferred, the dark spices can be put in a bag and then into the pickles to boil for fifteen minutes.

ALMOND CAKE.—One cupful butter, two cupfuls sugar, one cupful sweet milk, three and one-half cupfuls flour, whites of eight eggs, one teaspoonful cream tartar, one-half teaspoon soda or two teaspoonfuls baking powder; flavor with almond. Bake in layers, spread each layer with soft frosting, and sprinkle split blanched almonds on each layer.

DINNER SERVICE.

THE ENGLISH, FRENCH AND RUSSIAN STYLES.

There are three recognized methods of serving dinner to guests. The first is the *service a l'Anglaise*, in which all the food is placed on the table in successive courses and carved there. This mode of service has been discarded these twenty years past from tables of uppertendom as a clumsy and dilatory process, although, when the party is small, and the host—or, better still, the hostess—is a good carver and can talk instructively or wittily about gastronomy, a dinner served *a l'Anglaise*, with all the viands brought to the table, may be made a most charming and refined entertainment. To see a thoroughly high-bred lady carve a goose, and hear her expatiate with graceful sympathy on the excellencies of the bird, are in themselves a liberal education. In the *service a la Francaise*, now almost obsolete, save among the *haute Bourgeoisie* in France, the viands of the first course are always placed on the table, even before the guests enter the room. The dishes of the second course are tabled as those of the first course have been, but at the end of the second course everything appertaining to the kitchen must disappear, and the third course, of sweets, confectionery and ices, is arranged in symmetrical order on the table. The dishes are handed round to the guests, and are then replaced on the table in case any lady or gentleman desiring more of any dish may, like Oliver Twist, "ask for more." In the *service a la Russe* the hot dishes are not placed on the table at all, but are carved in the kitchen, dished up, and then conveyed to the dining-room, to be handed at once to the guests. Large dishes or removes too voluminous to be passed round the table may be carved at a side table and be served on hot plates to the guests. But in a *diner a la Russe* the cold dishes, the cold entremets, pièces montées, and all dishes appertaining to the dessert are placed on the table at the beginning of the repast, and for the most part remain there as long as it lasts. The table laid according to the Russian method of serving has a central *epergne* or artistic trophy surmounted by a bouquet of flowers. The service *a la Russe* differs only from that of *a la Francaise* in so far as, in the first instance, the guests do not "see their victuals" in their entirety on the table itself. Still the dishes, symmetrically carved, are handed round, so that each guest may have a choice of morceaux before him. You and your neighbors have their turn, a whole salmon, an entire pheasant, scientifically cut up, to select a slice from; whereas in the monstrous caricature of the service *a la Russe* which at present obtains in society, a handsome piece montée, or artistically built up dish, such as a poulet a la marengo or a saumon a la Chambord, is rarely seen, and the dinner practically resolves itself into this: You sit cabined, cribbed and confined between two more or less agreeable people, who are as cramped for room as you are. Your opposite neighbors you cannot see, owing to the forest of flowers and ferns with which the board is overladen; and, from time to time, half-cold scraps of you know not what are thrust over your shoulder by the cotton-gloved paws of you know not whom. The dinner is fearfully long. When you think, rejoicingly, that it has come to a blessed end, it breaks out again in the form of dabs of caviare on sippets of cold dry toast or ramequins of cheese, or slices of German sausage, or some other *hors d'œuvres*, which should have been served before the real dinner began or not at all. We have seen offered, a short time ago at a swell dinner, between the quail and the ice-pudding, macaroni with mustard, toasted sardines, *canapes* of anchovy paste with cayenne, cheese biscuits with nepaul pepper, and the roes of smoked herring. What for? To provoke an artificial thirst and excite one to drink more wine! Why, a quarter of an hour after the conclusion of the dessert some very ill-made black coffee usually makes its appearance, and the host suggests, in a sheepish manner, that you should join the ladies. The modern *diner a la Russe*, so called, is a solid, stupid, uncomfortable sham, and is only hypocritically enjoyed by gentlemen who would infinitely prefer to dine quietly at their club, and by ladies who have already partaken of a real and substantial dinner in the guise and under the name of luncheon, who have subsequently regaled themselves with fruit cake and cream puffs at the five o'clock tea, or with chicken sandwiches and champagne, or with strawberries and cream at a garden party, and who do not sit down at the eight o'clock dinner for the purpose of eating but for that of criticising the dresses and diamonds of their neighbors. In fact the whole affair is accompanied by so much form and ceremonious humbug as to prove a stilted and extremely stupid affair. The wonderful floral hot-house built upon the table appears to be a matter of far more importance than either the comfort of the guests or the digestibility and excellence of the foods prepared.

LOVE AND CARPETS.

THE ALMOST FATAL CONSEQUENCES OF A DIFFERENCE IN TASTE.

George Eliot says "A difference in tastes in jokes is a great strain upon the affections." The inimitable Anstey in a recent short story finds a difference of tastes in house-furnishing equally destructive to harmony. A fond lover, thinking to surprise and delight his bride, during her absence bought and fitted up the house which was to be their mutual home. The feelings of the unhappy woman must be imagined rather than portrayed. Heroically, however, she suppressed any remark and got out of the house without betraying her disappointment. Then followed a period of psychologic bewilderment. Surely she loved her betrothed; still, when that love was weighed against the carpet and wall paper with which it must be associated, it in some considerable degree fell short. Then she would accuse herself of ingratitude, and she finally resolved to die of agony rather than to reveal the despicable character of her woes. Having arrived at this admirable solution of the difficulty, she visibly faded and drooped, and with the approach of the wedding day her unhappiness increased. Fortunately a fire burned down the obnoxious house and all it contained, and the lover discovered his mistake in time to apply the insurance to a more judicious purchase. The situation is hardly overdrawn. What could be more horrible than to have to live with a wall paper or a carpet which one disliked. We recall once looking at a most convenient little office with a view to renting. We found in the room, however, a magenta lambrequin and a scarlet carpet. It was enough to counterbalance the advantages of situation, convenience and price.—*The Nightingale.*

THE CAUSE OF PALLOR.

Dr. Oppenheimer has published some careful observations on the blood of one hundred and nine pale female subjects, servant girls, conducted by means of Zeiss and Thomas's hæmocytometer and Gower's hæmoglobinometer. He considers the lowest number of corpuscles per cubic millimetre in a normal state of health as four million, and the lowest amount of hæmoglobin in health ninety per cent. He also agrees with Gröber's dictum: "Number of corpucles and hæmoglobin, both diminished, equal acute and chronic anæmia; number of corpuscles diminished, hæmoglobin relatively increased, equal primary chlorosis or pernicious anæmia number normal, hæmoglobin diminished, equal chlorosis." In severe cases of chlorosis, with tendency to faintness, headache, heart symptoms, and œdema without albuminuria, the hæmoglobin varied from thirty to fifty per cent. In fifty-five of the cases the condition of the blood was normal. These patients were found to be suffering from phthisis, cardiac disease (compensated), gastric ulcer, and various affections of stomach, intestines or other organs. Phthisis of itself—that is to say before hemorrhage, or diarrhoea, or profuse expectoration had come on—appeared to have no

effect on the blood. An interesting result was obtained in connection with gastric ulcer, in simple ulcer the blood was normal, except when there had just been hæmatemesis, but in carcinoma of the stomach both the number of the corpuscles and the hæmoglobin were subnormal. Pale girls sometimes take iron for a long time without any visible improvement. Dr. Oppenheimer finds that such patients are not anæmic, but chlorotic. The pallor of patients with normal blood appears to be due to the insufficient filling of the cutaneous capillaries. From the observations of Dastre and Morat there would seem to be an antagonism between the blood vessels of the skin and those of the abdomen; so that if one of these systems becomes dilated, the other, by an automatic reflex action, invariably becomes contracted. Because of the fact that irritation of the depressor nerve of the heart induces dilation of the abdominal vessels and contraction of the cutaneous vessels. Dr. Oppenheimer believes that the pallor of phthisis, cardiac diseases and kidney mischief is due to reflex action. In these affections the heart has extra work to do, and this affects, by means of the depressor nerve, the vaso-motor centre, causing a diminution of the cutaneous flow, and consequently a dilatation of the abdominal vessels. The pallor observed in most inflammatory affections of the hypogastric viscera may probably be explained also by the reflex action of the hyperæmic abdominal vessels upon the calibre of the cutaneous vessels. Under these conditions it is clear then that to cure pallor, it is necessary that the blood should be pure, and the circulation regular and vigorous. No other blood medicine is so well calculated to affect this as Ayer's Sarsaparilla, made by Dr. J. C. Ayer & Co., of Lowell, Mass. It restores the bloom of health to cheeks that have become pallid and thin, and permanently vitalizes and strengthens every organ of the body.

Anti-Fat.—M. Hiroguelle, a well-known gourmand and literary man of Paris, has been the subject of a surgical operation to relieve obesity, which was performed successfully by two surgeons recently. The latter, after putting him under chloroform, raised his cuticle and cut away four and three-quarter pounds of his adipose tissue. The skin was then stitched up, and a week later Mr. Hiroguelle had quite recovered from the effects of the operation, which is known as "de graissage," and bids fair to become the rage among fat men. He is reported to be overjoyed with the improvement in his figure, and to have decided shortly to undergo further parings of his body.

BUSINESS NOTES.

HORSFORD'S ACID PHOSPHATE.

A nerve food and tonic, the most effective yet discovered. Dr. F. G. Kelly, Alderton, W. T., says: "I have prescribed it in a large number of cases of restlessness at night, and nervous diseases generally, and also in cases of indigestion caused by lack of sufficient gastric juice of the stomach, with marked success, and consider it one of the best remedies known to the professional world."

THE KODAK.

If any of our readers are interested in photography, they cannot afford to be in ignorance of the wonderful little camera called the Kodak. It is the most ingenious piece of photographic apparatus that has ever come under our notice. It is so simple that a child can work it, and yet the results are so perfect that the most expert are proud to carry and use it. The Kodak embraces an entirely new system of photography, being loaded with a continuous band or spool of sensitive film, which enables the operator to make one hundred negatives with one charging. This film is as transparent as glass and as flexible as paper. It is wound upon a spool and is used in an instrument called a roll-holder, which is attached to the camera. After taking an exposure (as the taking of the picture is termed), by simply turning a key, the exposed portion of film is removed from its position back of the lens and a new portion brought into place. This is done by the film, which is in a continuous band, being wound off of one spool on to another. The great advantages of this system over the old-fashioned glass plates are enormous. Formerly the number of pictures that an amateur was able to make upon a journey was limited by his capacity as a pack horse, so to speak, but with the new system of film photography embodied in the Kodak material sufficient for several thousand negatives can be carried without inconvenience. The Kodak is a most unique and perfect camera, measuring but 3¼ x 3¾ x 6½ inches and weighing but 32 ounces. The pictures we have seen from this camera are of the very finest order, being very clear and sharp. It is particularly adapted for instantaneous work, such as photographing street scenes, objects in motion, etc. The Eastman Company, of Rochester, N. Y., who are the inventors and manufacturers, should be communicated with and one of their catalogues secured. See advertisement in another column.

College Athletics.—The University of Pennsylvania authorities have at last taken a hand in college athletics, and hereafter the students will be more restricted in the various sports. A set of rules, drawn up by a committee consisting of several of the faculty and representative undergraduates, will in the future govern all college contests. Among the rules is this: No student whose general average in the mid-term or term report is below "medium" shall be permitted to engage in any university athletic contests or match rowing races, or play in any match games of base-ball, foot-ball, cricket, tennis, lacrosse, etc.

A BUSINESS BENEFIT.

ADVANTAGES TO ADVERTISERS OFFERED BY THE AMERICAN ANALYST.

It has not the limitations of a daily paper. No one reads yesterday's paper. A monthly lives at least a month, while a weekly is fresh four times a month, and its audience is not limited by geographical lines, but the circulation is all over the United States and Canada.

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Our rates are as low as our circulation affords. Large circulation and original matter cost money, and those advertisers who desire to realize these benefits must expect to pay reasonably for them.

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Anything that our readers want, or for which a demand is to be created, not wholly of a local nature, will pay to advertise with us.

We take only advertisements from legitimate houses of really meritorious goods, and give them all the editorial assistance they deserve; consequently our readers knowing this, have confidence in advertisements contained in our columns.

The fact that we have the best and largest houses in every branch of trade advertising with us, and that they always renew as their seasons arrive, proves beyond a doubt that they have found the American Analyst a good advertising medium. Why should not you?

AMERICAN ANALYST

A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

LOCAL INSPECTION'S DEATH BLOW.

Such laws are clearly unconstitutional, * * * * * * * * * New Jersey meat could not be sold in New York, nor New York meat in New Jersey; but the law framers had not thought of such trifles.—AMERICAN ANALYST, *Jan.* 24, 1889.

The priviledges that are guaranteed equally to the citizens of all the States cannot be abridged for the benefit of those of any single State. The whole proposition of the "local inspection" agitators is monstrous, illegal and revolutionary, and their success in blinding the eyes of any legislative body into acquiescence with the measure would be speedily anulled when the subject should be brought before the courts for adjudication. Those are the views which the AMERICAN ANALYST has maintained from the beginning of the controversy.—AMERICAN ANALYST, *April* 11, 1889.

On the final day of its sitting, May 15, the Assembly of New York State rejected the Beef Inspection bill by a vote of 80 to 28. This action of the New York Legislature had been forecast in these columns. The ground of the project's repudiation was its manifest unconstitutionality. It was a thinly-disguised attempt to discriminate against Western meat in Eastern markets, and was as clearly in violation of constitutional provisions as it was opposed to public interests.—AMERICAN ANALYST, *May* 23, 1889.

The real fight in the matter is that which the retail butchers are waging against the Federal Constitution.—AMERICAN ANALYST, *Aug.* 1, 1889.

It is scarcely necessary to repeat the words in which a year ago we discussed the frantic effort the retail beef ring were then making in behalf of the monstrous "local inspection" scheme, in order to show that the AMERICAN ANALYST was consistantly opposed to that absurdity. It is somewhat to the purpose, however, now that the matter has been finally adjudicated upon by the highest legal tribunal of the nation, for us to show that apart from the general considerations it involved of inexpediency and public disadvantage, we maintained from the outset that the proposed measure was fatally defective because of its unconstitutionality. The extracts at the beginning of this article are a few casually selected out of a volume of our editorial utterances of that period. What we said then has just been fully corroborated by the United States Supreme Court, which, on May 19, rendered a decision in the important dressed beef case of the State of Minnesota appellant, against Henry E. Barber, brought on appeal from the decision of the United States Circuit Court for the District of Minnesota. The points of the case were related at the time in these columns. Barber was convicted before a Justice of the Peace in Ramsay County, Minn., of having wrongfully offered and exposed to sale, and of having sold, some fresh beef, part of an animal slaughtered in Illinois, but not inspected in Minnesota and "certified" before the slaughter, as required by the statute of Minnesota. Barber sued out a writ of habeas corpus on the ground that the statute was repugnant to the provisions of the Constitution giving Congress power to regulate commerce between the States, as well as to the provision declaring that citizens of each State shall be entitled to all privileges and immunities of citizenship in the several States. The Supreme Court, in an opinion by Justice Harlan, says: This act provides that all cattle, sheep and swine shall be inspected within twenty-four hours before the animals are slaughtered and that (if such be the fact) the inspectors shall certify that the slaughtered animals were found to be healthy and fit for human food. The sale of meat not taken from an inspected and certified animal is forbidden under penalty of fine or imprisonment. As the inspection must take place within the twenty-four hours immediately preceding the slaughtering, the act excludes from the Minnesota market practically all fresh beef, veal, mutton, lamb or pork taken from animals slaughtered in other States; and directly tends to restrict the slaughtering of animals whose meat is to be sold in Minnesota for human food to those engaged in such business in that State. This must be so, because the time, expense and labor of sending animals from points outside of Minnesota to points in that State to be there inspected and bringing them back, after inspection, to be slaughtered at the place from which they were sent—the slaughtering to take place within twenty-four hours after inspection—will be so great as to amount to an absolute prohibition upon sales made in Minnesota of meat from animals not slaughtered within its limits. It is one thing for a State to exclude altogether from its limits cattle, sheep or swine actually diseased, or meats that are unfit for human food, and punish all sales of such animals or of such meat within its limits. It is quite another thing for a State to declare, as does Minnesota by the necessary operation of its statute, that fresh beef, veal, mutton, lamb or pork shall not be sold at all for human food within its limits unless the animal is inspected in that State, or unless the animal is slaughtered in that State. The judgment of the lower court discharging Barber from custody is affirmed.

MUTUAL AID AND THE CENSUS.

No organizations in the United States have multiplied more rapidly in the past ten years than the sick-benefit, funeral-aid, death-benefit and other kindred societies As they are generally confined to those who are in the humbler walks of life, the good they have done is incalculable, carrying substantial aid to thousands of stricken families, and inspiring those who are fortunate enough in being members with a courage which might not exist in their hearts without them. The members of these organizations will be glad to learn that Hon. Robert P. Porter, Superintendent of the Eleventh Census, will endeavor to secure the statistics of the noble work these associations are doing, and it is safe to say that no other branch of the census will be more interesting. The business of gathering the data has been placed in charge of Mr. Charles A. Jenney, special agent of the insurance division, 58 William Street, New York City, and all associations throughout the United States, whether incorporated or private, should assist by sending to him the address of their principal officers.

HYPNOTIC RISKS.

A case of some public interest is reported by the *Lancet* as having been recently tried in a police court in the city of Nuremberg. A commercial traveler while in a restaurant told the waitress to look steadily at the white of his eye, and hypnotized her. On a second occasion he repeated the experiment, but this time the sleep was so profound that a medical man had to be called, who had the utmost difficulty in rousing the girl. The commercial traveller was accordingly summoned to appear before the magistrates, and the severe sentence of eight days' imprisonment was passed upon him, which will probably be efficient in checking similar performances in that region. In France the practice of hypnotizing people for amusement seems to be very common, and unpleasant consequences are often reported. At a supper

party in Paris recently one of the company hypnotized a girl and was unable to rouse her. She was consequently taken to the house of a medical man, and after a time she recovered consciousness. The whole party were taken into custody by the police, and were not released until next day. Even when hypnotism has been practiced by competent medical men for medical purposes unpleasant accidents and ulterior consequences have again and again occurred, so much so that recently an order has been issued by the French Government prohibiting surgeons in the army and navy from practicing it. It ought to be distinctly understood both by the profession and the public that hypnotism is not devoid of danger at any time, and not infrequently has permanently impaired the moral and emotional control of patients. A medical man is bound, before recommending hypnotism for a patient, to weigh the question as carefully as he would that of the advisability of administering an anæsthetic.

A STRANGE SHOWER.

A despatch from Cedar Rapids, Iowa, of May 20, relates a remarkable occurrence which interests and puzzles the scientific world. It says briefly: "A migrating bird wave which was passing over here Saturday night encountered a terrible rain and thunder storm, and, attracted by the electric lights, gathered about them on the streets, attempted to fly into the stores, and as a consequence over a thousand birds fell dead in the streets from coming in contact with the wires and glass fronts. A great majority of these birds do not inhabit this region, and some very rare specimens were captured alive and caged. Among them was a red poll warbler, one of the rarest birds in the United States. This bird nests in Manitoba and Alaska in the summer time and in the winter goes as far south as the Caribbean Sea, the only place it is found during the winter season being along the lower Rio Grande and Eagle Canyon, Tex. Over fifty different species were found."

MURDER MUST OUT.

(A NOT IMPOSSIBLE EXTRACT FROM NEXT YEAR'S MORNING PAPERS.)

Yesterday, before the theatres committee of the London County Council, the appeal of Mr. Henry Irving (the well-known actor and manager) against the decision of the sub-committee to refuse a license to the Lyceum Theatre, came on for hearing.

After Mr. Henry Irving (who appeared in person) had addressed the committee at some length, dwelling upon the character of the pieces he had produced during his management, and the care and expense with which they had been mounted, several members of the committee expressed a wish to put questions to him, which Mr. Irving promised to answer to the best of his ability.

Mr. Hecklebury—I think you told us that Hamlet was one of your principal parts? Is it not the fact that the chief character in the play drives his fiancée to madness and suicide by his cruelty, slays her father and brother, together with his own stepfather, and procures the death of two of his school-fellows?

Mr. Irving admitted that this was so. [Sensation.]

Mr. Hecklebury—That is all I wanted to ask you.

Mr. Fussler—I understand that you have produced a play called "Othello" on more than one occasion; perhaps you will inform us whether the following passages are, in your opinion, suitable for public declamation. [Mr. Fussler than proceeded to read several extracts to which he objected on account of their offensive signification.]

Mr. Irving protested that Shakespeare, and not himself, was responsible for such passages.

Mr. Fussler—Unfortunately, Shakespeare is not before us—and you are. You admit that you have produced a play containing lines such as I have just read. That is enough for us.

Mr. Medlam—Unless I am mistaken, the hero in "Othello" is not only a murderer but a suicide?

Mr. Irving—Undoubtedly. [Sensation.]

Mr. Medlam—We have heard something of a piece called "The Bells." I seldom attend theatres myself, except in the exercise of my public functions, but I do happen to have seen that particular play on one occasion. Does my memory mislead me in saying that you committed a brutal and savage murder in the course of the drama?

Mr. Irving said that, as a matter of fact, the murder took place many years before the curtain rose—otherwise, the member's memory was entirely accurate.

Mr. Medlam—Whenever the murder was committed, it remains undetected, and the criminal escapes all penalty—is not that the case?

Mr. Irving urged that the Nemesis was worked out by the murderer's own conscience.

Mr. Medlam said that was all nonsense; a person's conscience could not be made visible on the stage, and here a murderer was represented as dying several years after his crime, in his own bedroom, respected by all who knew him. Did Mr. Irving intend to tell them that such a spectacle was calculated to deter an intending murderer, or did he not? That was the plain question.

Mr. Irving thought that intending murderers formed so inappreciable an element in his usual audiences, that they might safely be left out of the calculation.

Mr. Medlam—but you might have an intending murderer among your audience, I suppose?

Mr. Irving's reply was not audible in the reporter's gallery.

Mr. Parseeker—I should like to hear what you have to say about duelling, Mr. Irving—I mean, is it, or is it not, a practice sanctioned by the laws of this country?

Mr. Irving said that he did not quite understand the drift of such a question; but, since they asked him, he should say that duelling was distinctly illegal.

Mr. Parseeker—You will understand the drift of my question directly, Mr. Irving. I have made it my business to acquaint myself with your dramatic career, and I find that you have played as hero at various times in "Romeo and Juliet," "Hamlet," "The Corsican Brothers" and "The Dead Heart," besides "Macbeth." Am I wrong in saying that in each of these pieces you fight a duel?

Mr. Irving—No. I fight a duel in each of them, except "Macbeth," in which there is no duel, only a hand-to-hand combat. "I do commit a murder in "Macbeth."

A Member—Mr. Irving's tastes seem to run in the direction of murders. [Laughter.]

After the report of the official censor upon the general tone of the Lyceum plays during the last fifteen years had been read a second time and adopted; the chairman, without more than a formal consultation with his colleagues, proceeded to announce the decision of the committee. He said that they had not come to their present conclusion without long and anxious deliberation. They were now the constituted guardians of the public morals, and must fulfil their functions without fear or favor. [Applause.] They must look at the character of the performance at each theatre, considering only whether they were or were not beneficial to morality. In the past, under a régime happily now at an end, public opinion had been shamefully lax and official control purely nominal, plays had been repeatedly performed and even welcomed as classics which he did not hesitate to say were full of incidents that were revolting to well-regulated minds. Shakespeare, who, with his undoubted talents, should have known better, was, so far from being an exception, one of the worst offenders. The council must free themselves from the shackles of conventional tolerance. [Applause.] Evil was evil—murder was murder—coarseness was coarseness, whether treated by Shakespeare or anybody else. Nor could the committee shut their eyes to the fact that Mr. Irving's histrionic ability, and his popularity with those who attended his exhibitions, could only intensify the injurious effect which such representations must have upon young and impressionable minds. In his opinion, much as he regretted having to say so, the Lyceum was nothing less than a school of murder. It aggravated rather than extenuated the evil, to be told, as they had been told that all these deeds of violence had been represented on the stage, with every aid which money, art and research could give. Again, was it desirable that the democracy should derive their ideas of the family life of crowned heads from being admitted into the scandalous secrets of the household of Hamlet? Or did they wish to see an injured husband following the example of Othello? A thousand times no. These things must be stopped. The Council was very far from taking a Puritanical view of the question—[applause]—they fully recognized that the stage was a necessary social evil, and, as such, must be tolerated until the public taste was sufficiently purified to refuse it further countenance; but, in the mean time, the Council must insure that such exhibitions as they were prepared to sanction were of a kind consistent with the preservation of good manners, decorum, and of the public peace—[applause]—none of which conditions, in the unanimous opinion of the committee, was fulfilled by the class of entertainment which the appellant Irving had, by his own admission, persisted in providing. On those grounds alone the committee dismissed the appeal, and declared the Lyceum Theatre closed till further notice. He might say, however, that they might possibly be induced, after a certain interval, to reconsider the question, and allow the theatre to be reopened on Mr. Irving's undertaking to produce dramas of an entirely unobjectionable character in future. [Mr. Irving begged for some more definite leading as to the dramas alluded to.] The chairman said that he had been informed that an illustrated periodical called Punch was publishing a series of moral dramas, in which the sentiments and incidents were alike irreproachable. Let Mr. Irving promise to confine himself to these, and the council would see about it. [Mr. Irving then withdrew, without, however, having given any definite undertaking, and the committee adjourned.—*London Punch.*

THE MODERN PIANO.

ITS GENESIS, DEVELOPMENT AND STATISTICS OF MANUFACTURE.

(Continued.)

Before proceeding with the details of the manufacture of the modern piano, it may perhaps be as well to quote what has been said by Frank Linstow White about the history of the manufacture of the piano in America. The piano was already known and manufactured in Europe when this nation was still in its infancy. Yet the inventive genius of the American once applied to this instrument, accomplished as much towards perfecting it as all the other nations put together. It is generally supposed that Benjamin Crehore, of Milton, Mass., made the first piano produced in this country. This was about the beginning of the present century. Adam and William Bent were making pianos in Boston as early as 1803. In 1810 the brothers Alpheus and Lewis Babcock, who had learned their trade with Crehore, joined with Thomas Appleton and the Hoyts, music dealers, under the firm-name of Hoyts, Babcocks & Appleton. After the war of 1812 the Hoyts went to Buffalo, John Mackay taking their place. The firm was dissolved about 1820. John Osborne worked with this firm, and subsequently set up for himself, and with him Jonas Chickering (1797–1853) and Timothy Gilbert worked as journeymen. James Stuart, a Scotchman who had the reputation of making an excellent piano, was associated for a time with Osborne, and later with Chickering. After the firm of Hoyts, Babcocks & Appleton had been dissolved, John Mackay was associated

for a few years with Alpheus Babcock. In 1830 Mackay formed a partnership with Jonas Chickering, which lasted until his death in 1841. Chickering had started in business for himself in 1823. He soon began introducing the improvements which have made his name famous, and the rapid perfection of the American piano is in a large measure due him. Alpheus Babcock of Boston, who afterward, and until his death, was foreman of the Chickering factory, and in 1825 patented a cast-iron frame for square pianos. In 1833 Conrad Meyer, of Philadelphia, also exhibited a piano with a full cast-iron frame. Babcock's plan of construction was greatly improved and modified by Chickering who, in 1837, made his first square piano with a complete iron frame, and three years later the first grand piano ever made with a full iron frame. About 1843 he took out a patent on an invention of great importance. This was the introduction of a cast-iron flange on the top of the plate covering the head-block, which flange was drilled for each string to pass through. This gave the strings a firm tendency upwards, and served at the same time as a transverse strengthening-bar. When grand pianos of this construction were sent to the International Exhibition of 1851 in London, they attracted considerable attention and were awarded a prize medal. In 1856 this method of construction was superseded by the "agraffe" system now in use. According to this a solid iron flange is cast on the under side of the iron frame, into which the agraffes are screwed. In 1845 Chickering invented and first used the circular scale for square pianos. The improvements mentioned are only the most important of those introduced by him. After his death in 1853, the business was carried on by his sons, under the old firm-name Chickering & Sons. The originator of the system of "overstringing," which Chickering did not adopt until 1853, is, it seems, not known. It has been claimed, however, that the first piano on this plan made in America came from the factory of John B. Dunham. Among Chickering's competitors in Boston were Lemuel and Timothy Gilbert, and about this time a number of piano makers were beginning to work in Albany. Among the first were Boardman & Gray and James A. Grovesteen. Later came Meecham & Pond John Osborne and others. Grovesteen went to New York in 1843 and retired from business in 1886. The prominent firms in New York at this time were R. & W. Nunns, who enjoyed an excellent reputation, Stoddart, Worcester & Dunham; Firth, Pond & Co., later Firth, Hall & Pond (the same Pond who was associated with Meecham in Albany); Bacon & Raven (established about 1840); William H. Gieb & Co.; Linden & Fritz, and Lindeman & Sons (established 1836); Henry Hazleton was an apprentice with Dubois & Stoddart in 1831. He and his brother were for a time with Bacon & Raven, but began business soon after that firm was established. When, some time before 1840, William Nunns left R. & W. Nunns, Charles S. Fischer entered the firm, which changed its name to Nunns & Fischer. Later, he and his brother, John W. Fischer, began conducting business together, under the name of J. & C. Fischer, by which the firm is still known. Frank and Napoleon J. Haines were apprenticed in 1839 to the N. Y. Pianoforte Manufacturing Company, and in 1851 started in for themselves. One of our earlier musicians, William B. Bradbury, also began to manufacture pianos in 1854, in partnership with his brother E. G. Bradbury.

A house that has played a prominent part in the growth and development of piano-making in this country is that of Steinway & Sons. Henry Engelhardt Steinway (originally Steinweg), the founder of the firm, was born in Germany in 1797. He was originally an organ builder, but soon began making pianos on a small scale, exhibiting some as early as 1839. In 1850 he came with his family to New York, where three years later he established the house which bears his name. The business increased very rapidly, and after repeated removals, the firm finally settled in its present quarters in 1863. The firm has patented a number of inventions, among which the overstrung scale (1859), an agraffe arrangement for square and grand pianos (1859), the duplex scale (1872) and the tone-sustaining pedals (1874–75). In 1833 William Knabe (1803–64) came to this country, and began to work in Baltimore, first under Hartge, and later alone. He and H. Gaehle went into partnership in 1839 under the name of Knabe & Gaehle, and when Gaehle died in 1855 Knabe continued the business under the name of William Knabe & Co. Another well-known house is that of Weber, also founded by a German. Albert Weber came to the United States in 1845, settling in New York. Seven years later he started in business for himself, but it was not until about 1871 that the business began to assume the large proportions to which it subsequently grew. The house of George Steck & Co., of New York, was established in 1857 by George Steck, the senior partner. Among the improvements which Mr. Steck has introduced is one patented in 1870 in the frame of upright pianos. One of the younger firms is that of Sohmer & Co., founded in 1872 by Hugo Sohmer and Joseph Kudor. They also have introduced several improvements in construction, among which the improvement of the "Allicot" system, by which they place the auxiliary tone-re-enforcing string above the other three, and arrange all the tuning-pins on one side. They have patented also an improved agraffe-bar for the upper three octaves of squares and grands (1882), a pianissimo pedal (1887) and an action in upright pianos for obtaining quick and certain repetition (1882).

The firm of Decker Brothers, of New York, established by the brothers David and John Jacob Decker in 1862, has also introduced several notable improvements, and is still adding to its reputation. Myron A. Decker (not related to the members of the preceding firm) began business in Albany in 1856, and four years later came to New York. Here he worked for seventeen years, sometimes alone, sometimes in partnership with others, until in 1878 he and his son formed the present firm of Decker & Son. Other firms of greater or less repute at the present day are Peek & Son (established 1850), Kroeger & Sons (Henry Kroeger came to New York in 1855, and was superintendent under the Steinways for twenty-four years); Ernest Gabler & Bro. (established 1854), Kranich & Bach, Calenberg & Vaupel (established 1858), Krakauer Bros., Mathushek Piano Manufacturing Company, Vose & Sons (established 1851), F. Bräutigam, F. Schuler, Behning, and Behr Bros. & Co. (founded in 1881), all of New York. The Henry F. Miller & Sons Piano Company of Boston, Mass., was organized in 1884, succeeding Henry F. Miller, who had established himself as early as 1863; the Emerson Piano Company and the Ivers & Pond Piano Company also have their headquarters in Boston. Many others, too numerous to name here, have arisen within recent years. The Mason and Hamlin Organ and Piano Company deserve mention for the new method of stringing it has introduced. By this system, which was patented in 1883, the strings are secured by metallic fastenings directly to the iron frame, instead of winding them around wrest-pins set in wood, as in the old system. The business of piano making in this country is continually assuming larger proportions, and new firms continue to spring up. Naturally a certain percentage of the work produced is cheap and poor. But on the whole the many useful improvements made in the construction of the piano by American manufacturers have served to make their instruments superior in many ways to those produced in Europe.

(To be continued.)

HUGE CHIMNEY.—A chimney has been designed for the Royal Smelting Works, of Saxony, Germany, by Herr Heneicke, that is to be 460 feet high, with an inside diameter of 23 feet at the base and 15 feet 6 inches at the outlet. The works will be connected with the chimney by a horizontal flue 1,093 yards in length, which crosses the River Mulda and takes an upward course of 197 feet to the top of the hill, where the giant chimney will stand as an example of engineering skill. It will take 1,500,000 bricks to build this perpendicular funnel, and its cost is estimated at about $30,000.

WAYS THAT ARE DARK.

THE ALLEGED ADULTERATION OF TEA IN CHINA.

For a number of years the Chinese have been exporting into Europe a tea-leaf which has a peculiar external appearance, to which the name of "gunpowder tea" has been given. This leaf, which does not possess the physiological properties of the true China tea, is sold as a distinct commercial species, under the name of "Imperial Chinese tea," although sometimes it is mixed in varying proportions with true tea leaves, which more or less approach it in its external characteristics. Specimens of this tea have been recently subjected to chemical analysis by Messrs. Riche and Collin (*Repertoire de Pharmacie*, February 10, 1890), who in comparing the result with hyson tea have stated that the ash of both specimens is about the same. As regards the presence of theine, the authors were unable to obtain any crystalline alkaloid in the so-called gunpowder tea, but only a greenish, viscid substance, and the authors hence concluded that those teas which do not contain theine cannot be the leaves of the *Thea Chinensis*. Further, it is claimed that this tea when rubbed up between the fingers leaves a yellowish-brown stain, and when the powdered tea leaves are treated with dilute sulphuric acid they become discolored and assume a blue color on the addition of caustic potash. These results, the authors claim, prove that the tea is contaminated with prussian blue, for a dense blue color is produced if they are added in the presence of an acid to a salt of iron. Further, the botanical characteristics of the leaves do not correspond with these of the *Thea Chinensis*, although the authors are unable to determine from what plant they are obtained.

LACTEAL OCEANS.

ENORMOUS STATISTICS OF THE MILK INDUSTRY OF THE UNITED STATES.

There are $2,000,500,000 invested in the dairy business in this country. That amount is almost double the money invested in banking and commercial industries. It is estimated that it requires 15,000,000 cows to supply the demand for milk and its products in the United States. To feed these cows 60,000,000 acres of land are under cultivation. The agricultural and dairy machinery and implements are worth $200,000,000. The men employed in the business number 750,000, and the horses over 1,000,000. There are over 12,000,000 of horses, all told. The cows and horses consume annually 30,000,000 tons of hay and nearly 90,000,000 bushels of corn meal, about the same amount of oatmeal, 275,000,000 bushels of oats, 2,000,000 bushels of bran, and 30,000,000 bushels of corn, to say nothing of the brewery grains, sprouts, and other questionable feed of various kinds that are used to a great extent. It costs $450,000,000 to feed these cows and horses. The average price paid to the laborer necessary in the dairy business is probably $20 per month, amounting to $180,000,000 a year. The average cow yields about 450 gallons of milk a year, which gives a total product of 6,750,000,000. Twelve cents a gallon is a fair price to estimate the value of the milk at a total return to the dairy farmers of $810,000,000, if they sold all their milk as milk. But 50 per cent. of the milk is made into cheese and butter. It takes 27 pounds of milk to make one pound of butter, and about 10 pounds to make one pound of cheese. There is the same amount of nutrition albumenoids in 8½ pounds of milk that there is in one pound of beef. A fat steer furnishes 50 per cent. of boneless beef, but it would require 24,000,000 steers, weighing 1,500 pounds each, to produce the same amount of nutrition as the annual milk product does.—*R. I. Monthly Bulletin.*

FEEDING NEW YORK.

WHERE THE FOOD FOR THE METROPOLIS COMES FROM.

Almost every section of this vast country contributes more or less of the provisions that are annually consumed in New York. For instance, the butter, of which 2,092,115 fifty-pound packages were here consumed during the past year, was received from New York State, Illinois, Iowa, Michigan, Pennsylvania, Ohio, Kansas, Nebraska, Minnesota and Dakota. Much of the choicest and most expensive butter is made in the central portion of the Empire State, although many of the brands of the Illinois, Iowa and Minnesota creameries are considered equally desirable. The cheese market is supplied principally from New York, Ohio and Michigan. Of this most delightful edible New York consumed in the twelve months of 1889 no less than 1,953,522 boxes, and we still live. The milk and cream are supplied by the adjacent counties of New Jersey and New York. Eggs arrive according to the season from New York State and nearly all States South and West. A great many are received from Canada. The largest supply comes from the West, even as far as California. At times shipments of limed eggs are received from Denmark. During the past year New York consumed 1,081,649 barrels of eggs. These barrels contain about seventy dozen each. As a rule, New York receives very little produce from the Eastern States. Their own markets consume it all. Game comes principally from the West. "John Brown's tract," New York, Michigan and Minnesota furnish most of the venison consumed here. Wild ducks come from the West and Chesapeake Bay. A great many partridges or ruffled grouse still come from the northern part of the Empire State, although the West furnishes the principal supply of them as well as prairie chicken or pinnate grouse and quail. The surrounding country sends in all the snipe and woodcock here consumed. The West sends the bulk of the live and dressed poultry to the metropolis. The very best quality of dressed poultry, however, comes from New York, New Jersey and Pennsylvania. New York State furnishes almost all the light country dressed hogs, such as are used by city butchers. The whole West furnishes the calves, beeves, sheep, lambs and heavy hogs (alive and dressed). New York City consumes vast quantities of beans, no less than 107,626 barrels being consumed here last year. The principal supply comes from New York State, with occasional large shipments from Italy and Germany, according to the size of the American crop. New York consumed 98,924 barrels of dried green peas from California and Canada in 1889. The bulk of potatoes received are from New York State, although, owing to the short crop of last year, we were compelled to import a great many from Great Britain, Germany and Nova Scotia. Maine furnishes a small portion of the supply. During the past six months this city consumed over 955,000 barrels of domestic and 350,000 barrels of imported potatoes. Onions are received largely from Spain, Egypt, Bermuda and the South. New York State and Connecticut furnish almost the whole supply of winter onions. Green vegetables begin to arrive early in the year from Florida and Bermuda, and follow the advancing season up the Atlantic seaboard. In the height of the summer, however, New York, New Jersey and Long Island furnish the entire supply. Apples come largely from New York State, although the West furnishes a portion during seasons of short crops. Early pears and grapes are sent from the South and New Jersey, but New York gives the bulk of the supply later in the season. Cranberries come principally from New Jersey and Cape God, and sometimes from Michigan when the Eastern crops fail. There was great scarcity of cranberries in the East last year. Early strawberries, like early vegetables, begin at Florida and follow the season up the coast. The orange and lemon supply comes principally from the Mediterranean coast; but Florida, New Orleans and California contribute their portions. Bananas come almost exclusively from the West Indies. Peanuts come principally from Virginia, very few being received from Africa nowadays. The city gets its hickory nuts from New York, New Jersey and the West, and its pecans from the Southwest. Honey comes almost exclusively from New York and California.

NAVIGATING THE AIR.

THE OBSTACLES THAT PREVENT AERIAL NAVIGATION.

It may safely be said that the navigation of the air is a practical impossibility, and that no balloon, air-ship, or other means of conveyance which can be propelled through the air in a definite direction, under the control of the operator, will ever be constructed. But as this method of travel is confidently predicted by many as a development of the near future—and even now announcements of a discovery of a means of navigating the air appear more or less frequently—a consideration of some of the theoretical principles involved may be of interest. It is evident that a practicable air ship must contain within itself the power to make it rise in the air, as in the case of a bird. No balloon could ever possibly be forced through the air against a wind of any velocity. The immense surface presented to the action of the wind would require a force to overcome it far beyond any that we could produce; and even if it could be accomplished, it would only result in its immediate destruction by tearing the necessarily light and fragile material of the balloon into fragments. It would be as easy to drive a balloon at a high rate of speed underneath the ocean itself as to make any headway against a wind of only moderate violence. It is a necessity, therefore, of a practicable air-ship that it must contain within itself not only the power to move it through the air, but to sustain it at the required height. A bird does this, it is true; but the body of a bird has a very small weight in proportion to the force developed by its organism. It is like a motor which has only to move itself. But we have no artificial motor which can begin to compare in efficiency with the natural one possessed by the bird; and besides an air-ship must not only raise and move itself—and the weight of all our artificial motors is very great in proportion to the power they exert—but it must also carry the weight of passengers, baggage, supplies, and many other things, all of which increase the power necessary to raise them to an immense degree. Theoretically an air-ship is possible, but a calculation of the force necessary to lift into the air even the lightest and most efficient form of steam engine known to us will show that it is far beyond any power that it can develop, to say nothing of the addition of psasengers or freight, and the driving of the whole through the air against the ever-prevailing winds. The storage battery has been suggested as a feasible means of supplying this power, but the storage battery is even less efficient in proportion to its weight than the steam engine, to say nothing of the practical difficulties in the way of recharging it with energy. As far as we can now foresee, the railroad will always remain our best means of locomotion. Undoubtedly immense improvements will be made in our present system as regards safety, comfort, speed and economy; and although the traveler of a hundred years hence may, very likely, look back upon our limited expresses as only fit for emigrants, yet we are inclined to believe that the fundamental type of the railroad will always persist, and that as long as the human race remains upon the earth it must confine itself in its movements to the surface of land and water. —*Pop. Science News.*

GLOVES AND SHOES.

SOME VALUABLE HINTS FOR THE CONSIDERATION OF THE FAIR SEX.

On the principle that "All's well that ends well" the appearance of a woman's feet is of supreme importance. Treat your shoes tenderly. Have one pair sacred to rainy weather, for rubbers ruin fine leather. Avoid varnish and blacking of all kinds, and substitute vaseline. First, rub your shoes with a piece of old, black silk, then apply the vaseline with a soft, black kid glove. If you insist on your dressmaker facing your gowns with velvet or velveteen instead of braid, you will lessen your shoemaker's bills and be saved from the purple blemish on the instep caused by the movements of the skirts in walking. When buttons come off don't hunt up old shoes and use the shabby buttons, but invest five cents in a card of shining black beauties, and have them ready for emergencies. One old button spoils the style of a shoe. Gaiters are charitable things and cover a multitude of defects. Half-worn boots will last a long time under their kindly protection. Now is a good time to buy them and in most shops you can get a pair for $1.65. To save your evening shoes and slippers invest in a pair of white fleece-lined Arctic boots, which will cost $2, but save ten times that amount in carriage hire and medicine, not to mention the shoes themselves. After removing your shoes put them in correct position by pulling up the uppers and lapping the flap over and fastening one or two buttons. Then pinch the instep down to the toe, bringing the fullness up instead of allowing it to sag down into the slovenly breadth of half-worn foot gear. A boot that is kicked off and left to lie where it falls, or is thrown into the closet, will soon lose shape and gloss. Gloves should never be rolled into a wad or left lying inside-out. Pull off slowly and stretch each finger to its full length. Mend every minute rip with glove-thread and needles which come especially for the purpose. Wrap each pair in tissue paper, and keep in a long box, without folding. Eternal vigilance is the price of dainty clothing, daintily kept; but there is nothing that brings its own reward so soon as intelligent dealing with one's wardrobe.—*Ladies' Home Journal.*

FRENCH ECONOMY.

EXPENSE OF LIFE IN PARIS ABOUT AS GREAT AS IN OTHER LARGE CITIES.

What constitutes the dearness of living in Paris is the desire of each class to come up to the level of existence of that above it. This may be unconscious emulation, but affects the pocket none the less; nothing is so dear in the long run as the temptation to imitate some one richer than yourself; you can know where this commences, but never know where it will lead to. Even among the working classes, the era of new manners demonstrates that they have no more the parsimony of other days. For example: Deal furniture is replaced by mahogany, and the latter superseded by rosewood. Fabricants, naturally, encourage expenditure; thus a leading silversmith has on his price list fifteen different varieties of spoons, six of forks and seven of knives. Electro-plated ware in humble homes has driven away tin and Britannia metal. If articles be cheaper, more numerous varieties are employed. Parisians drink double the quantity of wine now—54 instead of 26 gallons per head annually—than they did 40 years ago. The consumption of spirits, tea and coffee has doubled; 33 instead of 20 pounds of fish; 200 instead of 158 eggs. Respecting meat, the ratio—augmentation is less; 198 instead of 163 pounds. Second quality aliments are less sought; in the case of bread, bakers who turn out second and third qualities have had to relinquish doing so. The large outfitting establishments tempt by cheapness and variety. Formerly it was possible to distinguish between the "classes" in the street; now that is impossible. The tailor who makes the man, has thus done more to fuse the classes than all the treatises of philosophy. It is calculated that 150,000 Parisians on a holiday, for excursions, expend nearly three francs each, or a total of half a million for the outing. The journal that the humble reader would stand aghast at if asked to pay 18 f. yearly in the way of subscription, he affects all the same by his one sou or halfpenny daily. Then there is among other latter-day outlays, the photographer which our grandfathers knew nothing about. Friends and relatives now exchange cartes. The young mother

must have "baby taken" at all stages of its growth; also, when children set out for boarding school or college. And lovers? Again, we make collections of photos as of postage stamps; as for the consumption of flowers, the florists' shops and stalls are legion; poor and rich buy them for presents on births and marriages and funerals. The most rapid fortunes are made by dealers in flowers. Other purse-drains: gifts on New Year's day, which are becoming preceded by those of Christmas; tips to house porters have risen. And the mixture of amour-propre, or false shame—that bizarre name for self-respect—contributes much to the emptying of pockets. The superfluity has become so mixed with the necessary that no one knows where to stop.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

May,

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Brant, pigeon, chicken, duck, turkey, goose, snipe.

FISH.—Anchovy, bass, catfish, cod, eels, clams, flounder, halibut, herring, lobster, mackerel, mussels, perch, porgie, rock-fish, salmon, shad, shrimp, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Artichokes, beans, carrots, garlic, lettuce, onions, parsley, parsnip, potatoes, shallots, spinach, turnips, watercress, radish, rhubarb, sea kale.

PRACTICAL RECIPES.

SOFT GINGERBREAD.—One cupful of molasses, half a cup of sugar, one egg, one cupful of sour milk, half a cup of butter, one tablespoonful of ginger; scant teaspoon of soda, flour to make thick enough to pour into a shallow pan.

COFFEE GINGERBREAD.—Two cupfuls of molasses, one of shortening, one of cold coffee, one teaspoonful of soda, one tablespoonful of ginger, two well beaten eggs, a little salt.

DAYTON CAKE.—One cupful of butter, two cupfuls of sugar, three cupfuls of flour, half a cup of milk, one and a half cupfuls of raisins chopped together with one cupful of walnut meats, five eggs well beaten, two teaspoonfuls of cream tartar, one teaspoonful of soda, one nutmeg.

MEAT CAKES.—Two cupfuls of finely chopped cold meat, one cupful mashed potatoes, a little chopped parsley, a bit of finely chopped onion, pepper, salt, a little grated lemon peel, one egg. Mix meat and potato thoroughly, add seasonings, bind together with the beaten egg, form into little cakes and fry brown in fresh lard or beef drippings.

STRAWBERRY JELLY.—Soak half a boxful of gelatine in one cupful of cold water. Put one quart of fresh strawberries over the fire in a preserving kettle and boil until they fall to pieces; squeeze out all the juice through a bag; add sufficient boiling water to the juice to make it measure three cupfuls, also one cupful granulated sugar. When it boils add the gelatine; when thoroughly dissolved strain into a mold. Set in a cool place to stiffen. Serve with whipped cream.

OYSTER PUDDING.—Scoop the insides out of a round loaf of bread, quite close to the crust; spread the outside with butter and tie a piece of foolscap paper about it; fill the hole with alternate layers of raw oysters and fried bread crumbs, season each layer and put little bits of butter on top. Bake about an hour and a half in a moderate oven, remove the paper and serve.

BANANA PUDDING.—Boil a fine white banana, pare it and pound it with three-quarter pounds of butter, half a pound of sugar, cinnamon and mace to taste, yolks of twelve eggs, whites of six eggs. Bake in a dish lined with paste and serve with powdered sugar.

TRIPE.—Dip the tripe, cut into equal pieces, in melted butter seasoned with pepper, salt and chopped parsley; roll such piece in fine bread crumbs and broil slowly. Serve with sliced lemon.

NOODLES.—Two tablespoonfuls of water, three eggs, a little salt, flour to make a thick dough. Knead fifteen minutes or so, roll out very thin, cut into small squares with a very sharp knife and let them dry for a couple of hours before putting them into the soup. They cook quickly.

BEDS AND HYGIENE.

WHAT BEDS SHOULD BE MADE OF AND HOW THEY SHOULD BE PLACED.

The hygiene of the bed is a subject of the greatest interest. It is the night clothing, as well for the sick as for the healthy. It occupies a preponderating place in hygiene, because we are destined to pass a third, if not a half, of our existence therein. The bed ought to be a protecting apparatus, and it should be of exquisite cleanliness, without which, writes Sacarsagne, "it will not delay to transform itself into a miasmatic and infectious agent, where come together and germinate all the morbid products of its neighborhood." The body is in immediate contact with its clothing; these absorb the products of secretion and of the cutaneous exudations. Thus they are rapidly soiled, which necessitates frequent renewal. This is one of the elementary principles of hygiene, too often disregarded. Against the changes of temperature we cover ourselves with linen or woolen fabrics, the number being in proportion to the degree of cold, but in general women cover themselves too much, and, having need of a bed more soft and warm, they crush themselves under a weight of clothing which enervates, prolongs sleep, and enfeebles the organism. The bed has for its base the mattress of wool or hair; feathers should be proscribed. They provoke abundant respiration, which, not drying, impregnates the body with humidity, and becomes the point of departure for visceral conjestions. Hair mattresses are certainly preferable, but the objection to hair is that it is too hard, but this may be obviated by the use of half hair, half wool. There remain the mattresses of wheat or oat straw, and these constitute, in our opinion, an excellent bed. They are soft, fresh, easily renewable, and it is to be regretted that their use is not more extensive, by reason of their numerous advantages. The pillows and the bolster, having for object the maintaining the head a little higher than the trunk, ought to be made of hair. As to the coverings of eider down, we have no good word for them. They are bad conductors of heat, and imprison the air in the midst of the feathers of which they are made, and retain the exhalations of the body. How to place the bed! That brings us to the choice of a bed-room. This, from a hygienic view, ought to be spacious, high, and provided with two or three windows, and ventilated by a large chimney, whose trap ought always and at all times to be open. The room should have as much sunlight as possible. The choice of the chamber being made, in what precise part shall we place the bed? In full light, and in the middle of the chamber, in such a way that the air and light may circulate freely, and in profusion, around it. An alcove is not to be tolerated; curtains around the bed are a remnant of barbarism, and can serve no good purpose. They hold myriads of microbes, and when closed obstruct free respiration.—*Popular Hygiene.*

NEW STYLE RECIPES.

SOME YANKEE SUGGESTIONS FOR MAKING AND DISPOSING OF PIES AND THINGS.

Housewives will find considerable information not otherwise procurable in the new cook-book of the Berkshire (Mass.) *News*, quoted by the *Hotel Mail.* These are some of the recipes:

Clear Soup—Take two pints of water, wash them thoroughly on both sides, pour into a dish or something, and stir around the kitchen until tired.

Plum Pie—Get some dough, hammer out a front and back breadth. Line a dish with silesia, put in a veneering of dough, fill the dish with Brummel's cough drops, put on the top crust, feather-stitch around the edges and bake in a tinker's furnace.

Pound Cake—Mix up some flour and things, put them into a dish, bake for a while, then screw in the handle and commence to pound.

Stomach Cake—Line a small boy with green apples and cucumbers. This can be prepared at short notice.

Calves' Foot Jelly—Get trusted for a Chicago calf—they have the largest feet—cut off the calf, which can be used for making hash or chicken salad; wash the feet, thicken with glue, add a few molasses, strain through a cane-seated chair, pour into a blue bowl with red pictures on it, set it in the shade to get tough. Then send it to a sick friend.

Ice Cream—Dry a piece of ice in the sun, stir in some cold cream or vaseline, fan it until it freezes, garnish with Christmas greens. This should be served with the soup.

Hash—Chop up everything, add some ready mixed paint, then throw it away.

Soft-boiled Eggs—Put a setting of eggs into a kettle of hot water at 6:57, let them boil until the clock strikes; serve on half shell.

To Remove Stains—To remove fruit stains from a tablecloth, saturate the cloth in benzine, kerosene, and coal oil, sprinkle with gunpowder; apply a lighted match.

One-two-third Cake — One egg, two flour, three bounce.

An Inexpensive Dish—Buy a five-cent plate.

To Drop Eggs—Let go of them.

Lemon Pie—Line a pie plate with puff paste (see page 5,275), put in your lemons, build a lattice work over the top, and bake three weeks.

RHYME ON TIME.—The lark came up to meet the sun and carol forth his lay; the farmer's son took down his gun and at him blazed away. The busy bee arose at five and hummed the meadows o'er; the farmer's wife went for his hive and robbed him of his store. The little ant rose early, too, his labors to begin; the greedy sparrow that way flew and took his antship in. O birds and bees and ants be wise, in proverbs take no stock; like men, refuse from bed to rise till half-past eight o'clock.

SIMILIA SIMILIBUS.—They have an effective way of dealing with habitual drunkards in Norway and Sweden. They put them in jail and feed them entirely on bread and wine. The bread is steeped in wine for an hour before it is served. The first day a man will take it, but before many more he will hate the sight of it. After an incarceration of this sort many become total abstainers.

DANGERS OF BORAX.—The German Government has forbidden contractors to supply the navy with preserved articles of food containing boric acid. This order is the result of the trial of a new preservative composed of equal parts of borax and salt, which has been sold as harmless. It was found, it is said, that persons partaking of meat preserved with this agent experienced gastric derangements.

THEIR DAILY BREAD.—Jay Gould's daily income has been estimated recently at $7,446, Cornelius Vanderbilt's at $15,249, John D. Rockfeller's at $18,715, and William Waldorf Astor's at $23,593.

VIOLIN QUOTATIONS.—Ten thousand dollars is now the highest recorded price for a violin. The Alard Stradivarius has passed from France to England for that sum, to go into the collection of a Scotchman. It is dated 1716. It is described in the catalogue of the South Kensington exhibition of 1872 as the only one in a condition of perfect preservation. It was bought in 1760 by an Italian amateur, Count Cozio di Salabue, after whose death it was purchased in 1824 by a famous collector, Luigi Tarisio. Tarisio hid it away, refusing to let any one see it, till his death in 1854. A year later it was purchased by Vuillaume. Its condition of preservation led to the belief that it had scarcely been played upon during the whole 150 years of its existence. Vuillaume left it on his death to his son-in-law, Alard, who has just sold it.

SOAPSTONE AND ITS USES.—A writer in a London journal calls attention to the unappreciated uses and preservative qualities of soapstone, a material, he says, which possesses what may be regarded as extraordinary qualities in withstanding atmospheric influences, those, especially, which have so much to do with the corrosion of iron and steel, and from experiments made, it is said that no other material is capable of taking hold of the fibre of iron and steel so readily and firmly as this. In China, soapstone is largely used in preserving structures built of sandstone and other stones liable to crumble from the effect of the atmosphere; and the covering with powdered soapstone in the form of paint, on some of the obelisks in that country, composed of stone liable to atmospheric deterioration, has been the means of preserving them intact for hundreds of years.

AN ELECTRIC TRAIN-BRAKE.—A new electric train-brake works upon the inside face of the wheels, or rather upon an iron disc fitted to it. The disc or annular ring is a large plate of iron of considerable thickness and several inches in depth, and is securely bolted to the inner side of the wheel. Opposite this ring is another, which encircles the axle loosely and is fixed by stays in such a manner that it cannot revolve with the wheel, but can be removed laterally so as to come into contact with or recede from the ring attached to the wheel. It is attached to powerful magnetic coils and constitutes a large electro-magnet. When the electric current is applied to it, it is powerfully attracted to the plate on the wheel, with the effect of arresting its revolution and so acting as a brake.

SCHOOL OF DEPORTMENT.—Washington correspondents state that the wife of one of the cabinet ministers has introduced a new fad in Washington, and has a class of young women meet at her residence twice a week, where a professor of physical grace from abroad teaches them how to walk, to go up and down stairs, to bow, to smile, to dispose of the hands.

EDIBLE CARDS.—A London confectioner has placed on the market a menu card made of sweetened dough rolled out very thin. The bill of fare is printed on this in ink made from colored sugar. Having ordered the dishes you want, you amuse yourself while waiting for them by eating the bill of fare, which acts as an appetizer.

LIGHT AND VENTILATION.—A novel arrangement for securing an abundance of soft light together with perfect ventilation has been installed in an opera house in Chicago. The device is, in form, similar to a large parasol, eighteen feet in diameter, the perforations in the cover permitting the escape of the vitiated atmosphere. The rod and handle are formed to permit the use of gas jets if necessary, while from the tips of each rib incandescent bulbs hang, giving a perfect and powerful circle of light. Another feature is the use of incandescent bulbs, arranged in a wire net, to indicate the name of the company playing.

NATIVE WINE.—The highest price paid so far for California wine is that which one of the largest dealers got not long ago far a splendid white wine made for a man enthusiastic about native products. He asked a grower in the southern part of the State to get up a wine regardless of cost. The grower selected the best grapes he could find, took the greatest care with the different steps of the processes, and finally obtained a wine that compared admirably with similar wines from the Rhine. Not much of it was made, and when it was bottled its cost to the maker was $4 a quart. The enthusiast is a New Yorker, and he is saving the wine as a miser saves his gold. Once in a while he brings out a bottle for a man who professes to be a judge, and generally astonishes him with the announcement that it is an American growth. The enthusiast says the wine naturally has improved with age, and he is hopeful that the day will come when the cost of making such a wine may be so reduced that equally excellent vintages may be enjoyed by many and not alone by a few.—*Hotel Mail.*

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CONTENTS.

HOME OR HOSPITAL?

In the time of Spenser the word "hospital" meant a house for the entertainment of guests, an inn. This meaning has become obsolete, and Webster defines a hospital to be a building intended for the reception and treatment of the ill, infirm and afflicted. While hospitals may now be found all over this land, an erroneous conception of their purpose seems to be prevalent in the public mind. The word to the masses is so closely associated with the notion of charity, that the thought of the hospital as a refuge for the sick or wounded, where, with proper appliances, the constant attendance of physicians, surgeons, nurses and apothecary, experienced cooks to prepare suitable food, and the most favorable surroundings, the chances are much more favorable for getting well, never enters their heads. They do not seem to think that in a hospital they can pay for their accommodation, just as at a hotel; that they can obtain all the aid a hospital affords, according to their tastes and means, from a cot in a general ward to a suite of private rooms. They forget that by thus using the advantages of a hospital, they can add to its funds, and enable it to extend its charities to those less fortunate than themselves. A few, when recommended to enter a hospital, will make the foolish objection that at those institutions the doctors experiment on their patients. To such we can only say that medicine is rapidly becoming, like surgery, an exact science, and that the scientific physician knows precisely what the medicine he prescribes will or ought to accomplish, just as the skillful surgeon foresees precisely the result of his operation. The only advantage, then, of home over a hospital—if it is an advantage—is in the proximity of the patient's beloved ones. This is more apparent than real, for friends can be with the sick in the hospital as much as is good for the patient. No one can doubt that in cases of serious illness a trained nurse knows better how to act than the most loving relative or friend, or that the constant nearness of a physician is preferable to having to send for the attending physician to come, who may not always be readily obtained. In cases where surgical aid is necessary, the manifold appliances, always at hand in a hospital, calculated to relieve suffering and pain are certainly more to be desired than bare home surroundings with helpless hands. The chief drawback to the more general employment of hospital accommodations by those who are able to pay for them, seems to be that great bugaboo of our social life: "What will people say?" As statistics have proven that hospital patients do better than those treated at home, by nearly one hundred per cent., we earnestly urge the more general employment of the unrivalled accommodations of our magnificent hospitals.

DAILY, HEBDOMADAL, PERENNIAL.

"No one reads yesterday's paper."—ANALYST.

Nonsense. Scores of thousands of people, two days distant from New York, are delighted to read on Wednesday our Sunday issues.—*N. Y. Press.*

That is very true brother Howard. A Sunday newspaper is in fact to-day's paper anywhere at the time of its receipt through the mail. Moreover the variety and comprehensive scope of the material that renders such papers as the Sunday *Press*, in common with that day's issues of the most of our metropolitan papers, so attractive, give an enduring value to those publications. The Sunday paper nowadays bears a stronger resemblance to magazine literature than to the ordinary daily newspaper. It is not so much a Sunday issue of the latter as it is a distinct weekly journal of miscellaneous information, with an admixture of gathered news, for which Sunday is selected as the day of publication. The better order of these weeklies, of which the Sunday *Press* is an admirable exponent, do not readily become "yesterday's papers." Their freshness is perennial. Such likewise is the case with the AMERICAN ANALYST. It, too, is "not for a day but for all time." The five bound volumes of this journal embody a mass of information of practical value to every housekeeper, every consumer, and every honest manufacturer, and every patron of honest goods, such as cannot be found elsewhere in the same convenient form, and the usefulness of which is everlasting These are points that specially interest the advertising community. The majority of our subscribers preserve their copies for binding and permanent preservation, and our pages are certain to be read and studied after thousands of successive daily papers have been read and thrown away as exhausted "back numbers." Life is too short in this busy period to permit men to read "yesterday's paper." In fact a man of affairs has in ordinary times scanty leisure to digest even "to-day's" paper, notwithstanding that it is made up for the most part of news—or what is claimed under that fascinating name. Respecting the Sunday papers to which we are referred by the *Press* paragraph, they are, as we have intimated, of various qualities, besides being in some instances of such enormous proportions as to preclude their complete perusal even though all the working hours of the entire Sabbath were devoted to that laborious task. It is to these promoters of flippancy that Mr. Joseph H. Choate forcibly referred at a recent meeting of the Free Circulating Library of this city. He said: "To my mind there is no more pernicious and demoralizing mental habit than that jerky and scrappy habit of attempting to read a Sunday newspaper. Just think of what they are—all alike, and the same Sunday after Sunday. Fifteen pages of advertisements and twenty-five pages of reading matter! Two or three columns of foreign correspondence containing all the scandal of Europe, as if we had not enough in this country; three or four columns of interviews and descriptions of great men; how Chauncey Depew gets up his fascinating speeches; how our chief magistrates, past and present, spend their time; how Mr. Harrison gets up in the night and tosses the baby, with flattering likenesses of Harrison and the baby; what Mr. Cleveland eats for breakfast; how Carl Schurz takes his exercise, and what is his favorite brand of cigars; Talmage's last sermon, detailing what will finally happen to almost everybody if they don't look out. Now, what good can come to the people of this city, who spend five hundred thousand to a million hours every Sunday reading such stuff.?" Mr. Choate could have rounded off his speech with effective and truthful grace if he had referred to the incalculable good that would come to this community if five hundred thousand of its population should each spend one hour weekly reading the AMERICAN ANALYST. After church there could be no more salutary Sabbath occupation.

AN IMPEDIMENT TO WAR.

The new gun with which the German infantry is to be equipped bids fair to revolutionize infantry tactics and to make war so dangerous that enlistment will be a matter of difficulty. The new instrument is the

small calibre repeating gun of the model of 1888. Its range is 12,500 feet, or 1,600 feet greater than that of the weapon whose place it takes. It is very light and is constructed for the use of the new smokeless powder. Earth breastworks less than 2½ feet are no protection against this terrible weapon. A description of it says: "From now on even the stoutest trees will give the foot soldier in battle little protection, for the balls from the new guns will simply pass right through the trunks. Six men in column, each seven paces from the man before him, may be shot through with one bullet, provided that it comes in contact with no metallic substance on the persons of any of them. The advantage that the bullet of the new gun leaves only a small hole behind it is comparatively insignificant. Moreover, should an enemy, as has often happened, defend himself behind a village or courtyard walls, he will be protected only in case the wall is remarkably stout, for balls from the new guns have repeatedly penetrated with ease walls a brick and a half thick." With a range-finder attached to such a weapon as this, making every bullet that it fires effective, its murderous qualities will be so complete that no one exposed to its fire could live. But when wars get to be so dangerous as this, and recruits know that the chances of escape are not more than one in one hundred, where will the governments get their troops?

INFECTING HEALTH RESORTS.

According to the *Sanitary News* the statement in the German papers that the number of resident consumptives, in northern Italy is steadily on the increase, has greatly excited the natives of that region. The cause of this increase is stated to be the sojourn of consumptives to that country in search of health in the balmy air of the Mediterranean Sea and the undoubted contagiousness of the disease. The people of southern California protest against that country being made the transient home of consumptives who spread the disease among the natives. All this forcibly suggest the care that should be observed by consumptives wherever they be. It is now known that a consumptive can even inoculate and re-inoculate himself if proper care is not taken in disinfecting, and the contagiousness of the disease is no longer questioned. Health resorts and salubrious climates are recommended to such patients, but without proper care great harm may grow out of this method of treatment, as the health of others is continually menaced.

CLARET.

SOME FACTS CONCERNING THE CONDITION AND PROSPECTS OF FRENCH CLARET.

An English connoisseur in wines, Mr. W. Beatty-Kingston, has lately made a careful study of the Bordeaux wine-growing district, and has published the results of his observations in the last number of the *Fortnightly Review*. A good deal of interest attaches to what he has to say about the redemption of the vineyards from the phylloxera, the volume and quality of the last crop, the classification of the growths, and the adulteration of the wine exported. Although the products of the Medoc vineyards are highly prized in the United States, and are said to be better known and appreciated in England than they are even in France, Americans and Englishmen are strangely unfamiliar with the nomenclature of the Bordeaux wine trade. This ignorance leads them to misconstrue absurdly the labels on the casks, cases and bottles shipped from the Gironde. Such names as Medoc, St. Julien, Margaux, St. Estèphe, Pauillac and Cantenac are often supposed to have some specific and definite significance. As a matter of fact, Medoc, or "'Twixt Water" (a corruption of *in medio aquæ*), is the name of the whole district stretching from Bordeaux to the Atlantic. The other five names mentioned are those of communes, in each of which may be grown a hundred different grades of wine. The so-called *chateaux* are, for the most part, unassuming one or two story country houses, whose names are applied to wines grown on the surrounding estates. Not all the chateau wines figure in the classification adopted in 1855, though some now excluded are, according to Mr. Kingston, likely to be admitted when the classification is next revised. Thus the claret produced by the vineyards of Chateau Loudenne, which is now the model-wine-growing estate of the Medoc, is at present unclassified. There is, by the way, a great deal of misconception current in England and this country touching the classing of Bordeaux wines. It is worth while to bear in mind that in classification No. 1 only four wines are included: Chateau Lafitte, Chateau Margaux, Chateau Latour and Chateau Haut-Brion. In the second class are grouped sixteen chateau wines, among them Brane-Mouton, Cos d'Estournel, the three Leovilles, two Laroses, two Pichons and two Rauzans. The third class comprises thirteen celebrated growths, some of which are Lagrange, Giscours and Palmer, are well known, and command high prices on both sides of the Atlantic. In the fourth class are ten fine wines, with one of which, Chateau Beychevelle, Americans are familiar. Pontet-Canet heads the fifth and lowest class, which comprehends seventeen chateau wines. One of these, Mouton d'Armailhac, is commonly imagined to be of a much higher class. Below the classed wines come the innumerable *bourgeoise* growths, and last of all the peasant growths, which reach us under the generic name of Medoc, or the vague communal appellations of St. Julien, St. Estèphe, Margaux, Pauillac, and Cantenac. How important some definite knowledge of the local classification is to the buyer may be inferred from the fact that the four great wines of the first class fetch in Bordeaux thirty per cent. more than the renowned Leovilles and Laroses of the second classification, and five times the price paid there at first hand for the best *bourgeoise* growths; this, although the unclassified *bourgeoise* growths include such chateau wines as Loudenne, Le Crock, Laujac, Bessan, Sigognac and Verdignan. Mr. Kingston considers the exceptional commercial value of the four first-class wines absurdly disproportionate to that at which certain superb unclassed wines of the Medoc are appraised. It is estimated that the loss suffered by France between 1875 and 1887 by the visitations of the phylloxera and of the pernicious fungoid pests, mildew and anthracnose, amounted to two thousand millions of dollars. At last, however, the defeat of the phylloxera and mildew has been decisively accomplished. In the Medoc district since 1882 (when the soil around each stock was saturated with a solution in which neither insect nor fungoid could live), the old vines have recovered health, while those planted afresh are extremely flourishing. The yield of three successive years (1887–8–9) has far exceeded the average of the previous decade, and justifies the Medoc wine growers in looking forward to an era of unexampled fruitfulness. The amount of wine produced last year in the Gironde was sixty-six millions of gallons. The vineyards of the Chateau Lafitte alone yielded twelve hundred hogsheads, and those of the Chateau Loudenne about as much. It is, of course, well known that the Chateau Lafitte belongs to Barons Alphonse, Gustave and Edmond de Rothschild. There is a prevailing impression among the consumers of claret in this country that the growths of the Medoc are frequently adulterated, or at least doctored, before exportation. If adulteration takes place, it is after and not before the wine is shipped from Bordeaux. After a careful investigation of the subject, Mr. Kingston was convinced that, whatever may be true of French wines from other districts, no adulteration whatever is practiced by the exporters in connection with the products of the Gironde. He declares Medoc claret to be what it professes to be—pure grape juice, free from admixture of any other substance, and owing none of its characteristics (color, flavor or strength) to "preparation" or "treatment," such as is undergone by all other varieties of French wine, some of which are fortified with alcohol and sweetened with syrup, while in others the process of fermentation is arrested. As for the cheap, fabricated wine consumed by the working people in France, none of this is exported, for the conclusive reason that it will not keep more than a few days or bear sea transportation. When such stuff is sold to us on this side of the Atlantic, we may be certain that it was manufactured here.—*Sun.*

CHINESE DOCTORS.

HOW THE CELESTIAL PHYSICIANS RESORT TO MAGIC AND DIVINATION.

The Chinese describe particular diseases according to particular planets, portioning out their relations to these and to the five elements, colors, tastes, points of the compass, viscera, etc., and gravely assign every disease to the prominence of one or the other, and treat them accordingly. No Chinese treatise on medicine would be perfect without a most elaborate and complete cosmogony, with which it invariably begins. The action of the two principles, male and female, must be clearly laid down, and each disease attributed to one or the other of them. This lies at the foundation of a correct knowledge of their mysterious and absurd doctrine of the pulse. The arts of magic have always occupied the chief part of the religion and philosophy of the lowest races of men. Among the Africans we find amulets in great use as objects of worship on account of their imaginary supernatural influences. Among the Turanian races (and the Chinese belong to this family) we find incantations and witchcraft or Shamanism occupying their place. Formerly diviners were maintained at the public expense at the court of the "Son of Heaven." While under the "Great Pure Dynasty," mandarins of the first and second rank were especially appointed to confer about the lucky days and *fengshui* of the imperial tombs, etc. In China magic has held sway more than four thousand years; and with this people, highly educated, but of a low type, if ever abandoned, it will be done slowly and with reluctance, even before the advance of Christian civilization. Yet all China is not given to such superstitions. The present Chinese dynasty banished healing by magic and charms from the medical college in Pekin over two hundred years ago, and have made it a punishable offense to practice these depraved methods. Were the arts of magicians confined simply to the healing art, the Government would tolerate them; but in too many cases they are made the

occasion to deceive the people, who are enticed thereby to enter into societies and embrace tenets which are hostile to the peace and stability of the throne. The whole art of healing by sorcery and charms is included in the term, depraved religion or doctrine. It is something deflected from the proper and perfect line of rectitude. In the time of Confucius these demoniacal arts and false doctrines existed, and were exercised chiefly by women who were able to cure disease and see and recall spirits. Whatever spirit may have produced the malady, these enchantresses had the power of driving them out. They were termed witches, and by this name they were always called in ancient times. In China, as in all countries, the magicians pretend to cure by means of cabalistic words or characters, spells, philters, incantations, jugglery, etc. Disease is looked upon as a punishment for sin in this or a former life, and therefore the spirits who are supposed by Heaven's permission to inflict these punishments by sending diseases must be appeased. If they cause, so can they cure disease. We often hear the Chinese remark that they are expatiating their sin in their disease, that it is the just retribution of heaven. They are thus ever anxious and ready to resort to the temples to burn incense, to discover the fates or appease the gods, and avert or remove some malady. The people have more faith in their gods than their doctors; for although they sometimes seek relief from their native physicians (if such they deserve to be called), yet they quite as often resort first to the temples. If the patient recover, it is attributed to the mercy of the god consulted; if he die, it is ascribed to fate. A large and increasing number from all classes, who find no relief from their idols and gods, come at last—often too late—to the foreign physicians. China, too, has her particular deities for particular affections—her special temples, where special divinities who preside over medicine, small-pox, infantile diseases, etc., have incense burned and worship paid to them. The fictitious Empress Panchen, supported by ten elder brothers and ten elder sisters, is the goddess of the "heavenly flowers" (small-pox); Tsni-sheng and Sung-sheng preside over the birth, sex, and diseases of children, and are always surrounded by numerous little clay images; Lii-tsu over all diseases in general, and Yao Wang (Prince of Medicine), by the name of *Tsun*, over medicine. Several celebrated doctors in the various past dynasties have been made the object of worship in the temples. A common mode of consulting the oracles or deities, both in the temples and on the streets, is by casting lots with a bamboo tube containing a hundred sticks. Each slip has a number corresponding to a stanza of poetry which is consulted to discover the mind of the presiding spirit, or it may refer to some medical work for the decision or prescription of the divinity, and thus the balm is applied. The object sought is discovered in a variety of ways through the means of this tube and slips. The tube is shaken until a slip jumps out, and this is sometimes repeated until a favorable answer is obtained. Another method adopted to ascertain the curability of the disease is to take three copper coins and throw them from a dice-box on the table. Certain conclusions are derived from these: thus, if the three turn up together, as reverse or obverse in six throws, uncertainty is the inference; if two obverse and one reverse or one obverse and two reverse occur three times in six throws, it is considered fixed and certain, and so on. Others practice by means of round pieces of wood with characters inscribed on them, which, from their position in relation to their theories of cosmogony, the "heavenly stems" or "earthly branches," the male and female principles in five elements, etc., delineated upon diagrams before them, are made to shadow forth the intentions of Providence in regard to the patient. There is also the plan of operating by means of a medium, akin to spirit rapping. Women often act as mediums. They get possession of some god or goddess, and through it, the divinity prescribes. The usual method of eliciting information from the spirit is to sit round a table, while two persons take hold of a round board to which a pen is attached at right angles. The table is covered with fine sand rolled even and smooth, so that characters may easily be traced upon it. Some charm written on yellow paper is either burnt over kelbat or at the door of the house, or at the temple of the divinity whose presence is desired. The whole thing is conducted with the utmost ceremony, exactness and faith. The spirit appears and delivers responses to the subjects submitted to its consideration by tracing more or less legibly in the sand. At the presence of a foreigner it complains and refuses to communicate. In one form the spirit comes at the mention of his name; in another, the patient or seeker must first walk a hundred steps, and that spirit which is first met is invited; as, for example, if thunder be heard on going out, the spirit presiding over thunder would be invited. The remaining processes are the same. Many of the gods of medicine are consulted in a very practical and tangible way. The patient rubs the part of the image which corresponds to the affected part in order that the god may know where his services are required. Outside one of the eastern gates of this city there is a bronze mule, the patron of the *literati*, which is quite burnished by the frequent rubbings of the peoplo in search of health. The patients never reflect that the mule is only a Nehustan, and nothing more. A practice common in some parts of China is to beat the bedstead with peat and willow branches for the cure of the sick. The Jesuits have written much about cures of this kind in China, and holy water has done good service in Japan. One relates that he cured a mad woman by hanging St. John's Gospel about her neck. Another practice is to invite the Taurist and Buddhist priests to the sick-chamber to expel the deadly influences proceeding from evil spirits. Mirrors are hung upon the walls to frighten them. Some of the spirits are active in creating disease in order to obtain food; and so food and fruit are always placed before these hungry gods to appease them. The priests besides chant their formulas and meaningless prayers, burn paper and incense, ring bells, beat gongs, and sprinkle water on the affected part or on the sick person generally. The water is used with the notion of purifying the patient, either preparatory to the spirit entering to cure or to cause the exit of the evil spirit. The Chinese use water so sparingly, being actually afraid that its use produces disease, that they may be said to be genuine hydrophobists. To abstain entirely from liquids or beverages is prescribed as a recipe for longevity. When thirsty the tongue must be so manipulated in the mouth as to cause a copious flow of saliva, and this goes directly to nourish the original and vital principle. The soul even after death —for the Chinese do die notwithstanding—requires looking after from the priests, if we may judge from the noise and time taken to perform the ceremonies before interment is respectable or the soul made happy. Nothing to residents in a Chinese city is more disagreeable than the incessant jinglings, lamentations and gongs; and in case of epidemics of cholera, typhus, small-pox, diphtheria, etc., no custom is more hurtful. Seven, fifteen or more days are sometimes devoted to incantations in a rich family. In a family of twenty-seven, twenty-six have been known to die within a month of diphtheria. The following will illustrate how a celestial sometimes obtains practice. N. was very poor, and took to divining on the streets under a mat awning or by an open table when the weather permitted. In his house, above the cupboard, there was the usual medical idol, Lii-tsu, and one night he dreamed that this god advised him to take to healing by charms, and promised to instruct him. Next morning, much to his astonishment, he found a volume on the subject, full of drawings of charms, beside the idol. With the god's assent and assistance, N. commenced practicing the writing of the charms, and when he became somewhat proficient, he began his craft, adding to it his divination and geomancy. He was soon called to attend one of the princes, when he correctly divined the disease by the eight diagrams, and prescribed the efficacious charm. All the prince's followers and retainers became his patients and disciples, and on his birthday and that of his wife they present him yearly with tokens of their regard and gratitude. His fame has become immense, and he runs great risk of being either knighted or deified. In concluding these brief and desultory observations on this branch of the Chinese healing art, we cannot do better than quote a single sentence from the preface of one of their own works on divination: "The augurs and magicians are prompted by the desire of gain, and sorcery is practiced with a view of ensnaring the people." They are often in collusion with the priests, and the gains are frequently mutually shared between them. Their exactions are sometimes almost too heavy to be borne. To the rich, the meritorious deeds to be done are increased; to the humble, the burdens laid upon them bring them to the verge of poverty, and they often pawn everything to appease the gods. But this charlatanism and quackery exist also very often between diviner and physician. Quacks join a league to increase their practice, and the sorcerers by their divinings indicate (as by the will of the gods) the physician to be consulted. These alliances are said to be the plague of every city.

THE DEADLY CIGARETTE.

ANOTHER BOY DIES FROM ITS POISONOUS EFFECTS.

Thomas Grey, aged thirteen years, son of Thomas Grey, of Verplank, N. Y., died on May 22, from the effects of excessive cigarette smoking. He had been fishing during the forenoon and waded in the water for several hours, and upon returning home in the afternoon was attacked with a congestive chill, succeeded by convulsions, death ensuing within a few moments. The Coroner impanelled a jury and an inquest was held, the jury rendering a verdict that the youth had died from heart failure, superinduced by cigarette smoking. It was the opinion of the attending physician that the boy would have recovered from the rigors of the chill but for the fact that the heart action had been so weakened by cigarettes that the natural recuperative power was destroyed. Young Grey had been addicted to the cigarette habit for several years and when he could not buy them he would beg them from his friends. The law prohibiting the sale of cigarettes to boys has not been enforced in Verplank, but it is thought that the death of young Grey will create a public sentiment which will cause a vigorous enforcement of the statute.

Milk Reform.—The milk dealers of Philadelphia oppose an ordinance before the council prohibiting the sale of adulterated or impure milk. It is claimed that its passage would put honest dealers to the trouble of testing their own milk to determine if it came up to the legal requirements. This should be no objection. The ordinance would drive dishonest men out of the business or compel them to become honest greatly to the benefit of the public.

Unique Book.—Wakeman Holberton, of New York, has completed a book that consists of a single copy that will never be duplicated. It is one of 101 quarto pages of imitation parchment, with every word an illustration of the story of the author's experiences with rod and gun on lake and in field and camp, done with his pen or brush. It was prepared by Mr. Holberton for his children.

Paper Pillows.—During the Franco-German war the ladies in England were busy making paper cushions which they sent to France to be used for the wounded in the hospitals. Hundreds of thousands of these cushions were sent and were of great service. Now all England is crazy on the subject of paper pillows again. They tear the paper into very small pieces, not bigger than one's finger nail, and then put them into a pillow-sack of drilling or light ticking. They are very cool for hot climates and much superior to feather pillows. Newspaper is not nice to use, as there is a disagreeable odor from printers' ink; but brown or white paper and old letters and envelopes are the best. As they are torn, stuff them into an old pillow-case, and you can see when you have enough. The easiest way is to tear or cut the paper in strips about half an inch wide, and then tear or cut it across. The finer it is, the lighter it makes the pillows.

BIRDS'-NEST SOUP.

COLLECTING THE MATERIALS FOR A CHINESE DINNER.

The New York correspondent of the Philadelphia *Inquirer* gives the following account of the preparations made on behalf of the Clover Club of that city for the enjoyment of a Chinese dinner: "He was in a Chinese grocery store; but such a grocery store! The oddity and variety of its wares were almost beyond comprehension. The clerks in charge numbered exactly fourteen. Each wore a blouse, each had a pig-tail, each breathed of opium and all fourteen, when they had recovered from their amazement at the entrance of a Caucasian, rushed forward and waited upon him in unintelligible chorus. Thanks to the instruction of the Chinese merchants and owing to the aid of a fat pass-book, in which English equivalents were given for Celestial hieroglyphics, order soon reigned over this confusion. The array of articles which the customer was informed he could obtain was absolutely bewildering and few of them known in American households. Information was sought first as to what Chinese grandees would place before their guests in a reception-room as appetizers for the banquet to ensue. Two bottles were produced, one swathed in wide bands of straw and the other a terra cotta thing of stunted growth. The first contained a sort of Chinese whiskey distilled from rice, white in color and bearing a remarkable resemblance in taste to crude coal oil, and rejoicing in the ponderous title of Sam-Suey-Bok-No-Ma-Thaio, which name upon oppressively convivial occasions is abbreviated into Sam-Suey. The second liquor is a Chinese brandy called Ung-Ka-Peh and really very palatable, resembling Curacoa very much in taste. With the aid of the fourteen clerks three bottles of each of these liquors were procured, and then when it was suggested that Russian caviare would be the proper appetite-whetter to accompany these bibibles, twenty-eight shoulders were shrugged in unison, fourteen voices shrieked a falsetto disapproval and twenty-eight hands produced a jar of Canton ginger, which the customer was informed was the only proper thing to eat before a meal. Then came the selection of the table relishes—which the American bill of fare insists upon calling *hors d'œuvres*—to take the place of the radishes, olives and pickles which generally grace the banquet board in crystal vessels. The Chinaman offered a wonderful variety of these things, but only the rarest were selected, these including gum-gwot, or preserved limes; gum-git, or preserved prunes; sziz-szue, or preserved shrimps; laichee nuts and preserved cocoanut cut in thin curling strips like Saratoga chips and slices of preserved watermelon, the heathen equivalents of the last two being too twisting for my American tongue. As it was not intended that the Clover Club should give an entire Chinese dinner, but simply one with a Celestial flavor, it was not necessary to purchase any substantial Chinese dishes, but of course it was important that an organization possessing such a great gastronomic reputation should make an American experiment with the much written birds'-nest soup. I had been given to believe that the houses of which the feathered inhabitants of the Celestial Kingdom had been robbed were sold in their entirety at so much per dozen. The emissary of the Clover Club, however, soon found that this is a delusion, as only the animal gluten which the swallows of the Chinese Sea deposit from their bills in forming their abodes is extracted therefrom by tweezers wielded by women and children, the product being somewhat like a mass of vermicelli broken into small pieces. But whatever it is the customer soon found that it is a rare product, for the fourteen clerks, after confessing that they sold it only on rare festal occasions in Chinatown, told with bated breath that it would cost $6 a pound, and that each pound would furnish soup for from ten to twelve people. When they were ordered to produce eight pounds the fourteen clerks disappeared under the counter, and when they got to their feet again demanded to see the color of the customer's money before they proceed any further with such a reckless purchaser. This difficulty was soon settled, and then when the information was sought as to how the bird's nest should be prepared each of the fourteen clerks furnished a different recipe. All agreed that chicken consomme would have to be used as a basis of making. The man who appeared to possess the greatest authority insisted that it could only be successfully prepared with the aid of a thin soup made from Chinese flounders, and when he was despairingly asked where in the name of all that is good the Chinese flounders were to be obtained within forty-eight hours, his head disappeared into a barrel, and when it emerged he bore aloft a large dried fish, flat and broad, and with flesh of salmon tinge. One pound of this was found necessary.

MEDICINE TO-DAY.

THE PHILOSOPHY OF THE RATIONAL USE OF MEDICINE.

Nothing indicates more clearly the modern progress of medicine than the disappearance of the bulky and disagreeable boluses, powders, draughts, and mixtures which the physicians of former times administered to their patients—in many cases, with but little effect, except to put an additional burden upon an already wearied and overloaded stomach. The homeopathic physicians have, at least, shown that excessive medication is unnecessary, and that no medication at all will result in an equal number of cures in a great majority of cases, while the present tendency of all schools of medicine is to limit their prescriptions, both in number and quantity, and place more reliance upon hygienic and sanitary precautions, combined with watchful and experienced nursing and care. The philosophy of prescribing what are popularly known as "medicines" is really a very simple matter. It is a well-known fact that certain substances, when taken into the system, produce certain physiological effects. Thus, opium and its alkaloids produce sleep, ipecac causes vomiting, quinine is found to have a remarkable power of controlling intermittent fevers, and so on through the list. There is really no difference between a medicine and a poison, except in the violence of its action; and, in fact, some of the most powerful poisons are found to be valuable medicinal agents when administered in minute doses. The scientific physician, therefore, will not attempt to "cure" a disease by any specific remedy, but will endeavor to fully understand the cause and nature of the abnormal physiological action which is taking place in the system of his patient. As the action of medicines is very variable in different persons, and under different conditions of the disease, the necessity of skillful medical attendance, and the folly of depending upon the various widely-advertised patent medicines, is evident. To a certain extent, the healing art must be empirical. Not until we can comprehend the actual nature of the vital processes, can a truly scientific system of medicine be formulated; and it is very doubtful if we ever arrive at that point. But the conscientious physician, no matter to what school he belongs, will use whatever remedy he may consider best adapted to the particular case before him. The homeopath has as perfect a right to administer a solution containing an infinitesimal fraction of a grain of common salt, in the belief that it will produce definite physiological effects, as the allopath has to administer a draught of "salts and senna." It is a matter of judgment and experience, and our issue with the homeopath is not that his theories are unphilosophical, but that they are not borne out by practical experience. So in the case of the practictioners of the less reputable systems of so-called medicine—the faith and mind healers, the magnetizers and mesmerists, and the compounders of the thousand and one absolute specifics for every disease, who monopolize so large a space in the advertising columns of the daily press. They are held to be unworthy of confidence, simply because the claims they make are not borne out by facts. Innumerable persons believe themselves to have been cured by these agencies, when, in fact, they have got well in spite of them, or because they were so utterly ineffective that they allowed the healing power of Nature to work unhindered. The natural tendency of most diseases is to recovery, and nothing is more natural than to attribute the cure to the particular drug or treatment which has been administered. If a man is so constituted mentally as to really believe that a cancer, for instance, can be cured by faith or will power, there is nothing left to do but to leave him to enjoy his belief, until he is restored to sanity again. No physician can afford to confine himself to any "system" as popularly understood. His own experience and that of his predecessors will show him what results may be expected from the various medicinal substances, and the highest skill of his art will lie in searching out the true cause of the abnormal condition of his patients, and, as far as it lies in his power, meeting these conditions with such remedies as may seem best fitted to aid Nature in causing the disturbed vital processes to operate with their accustomed regularity and precision.—*Pop. Sci. News.*

VEGETARIAN CHICAGO.

THE WINDY CITY DEVELOPS A FAD OUTSIDE OF ANARCHY AND WORLD'S FAIRS.

We have it on the authority of the Chicago *Herald* that with the decline of the faith-cure—the Eddy school in Boston having died a natural death—that well-worn fad, vegetarianism, has broken out in Chicago. Fads are parasites of civilization; a community that can sustain a fad cannot be an uncivilized community. Fad devotees must have some leisure with some wealth and no small amount of yearning for something to do. Ennui is one of the parents of fads. Vegetarianism long ago received its death-blow at the hands of physiological science, but its skeleton is galvanized at irregular intervals and made to dance before the public as a living substance. In one sense this does not concern the public; if people of mature age choose to confine themselves to a vegetable diet they have that inalienable right. If they prefer to keep up the body heat and nerve and brain force by two pounds of fuel—for food is fuel—where a pound and a half of proper food is enough, it is the concern of no one but themselves. But it is the concern of an intelligent public if such people force young and growing children to live—or to exist—upon an unnatural and unphysiological diet. A parallel case is that of persons that refuse all medical assistance when they are sick, placing their hope in faith, prayer and anointing. Several high courts have held that such people have no right to apply their dangerous and foolish practices to children. Animal food is essential to vigorous growth of body and mind, and no one has any right whatsoever to deprive any child of such food. The custom of cramming the stomachs of children with masses of vegetable matter, intended to do the work of a smaller quantity of proper food, would result in a nation of dolts with protuberant stomachs. It would be a waste of time to knock down such vegetarianism straw arguments and statements as the following: "Animal food injures instead of benefits a man. It creates a taste for liquor and tobacco. All meats contain the element that develops the lower faculties in man. Meat excites and the excitement wears off and leaves exhaustion. Potatoes are not vegetables; they are roots and are not fit for human use. The horse does not eat meat. His digestive organs are the same as those of a man." (Since when, and if so, why should we cook our food? If our internal economy is the same as that of a horse let business men waste no more time in going out to lunch, but repair their wasted tissues with a quart of oats taken from a nose-bag, flavored with the prospect of baled hay for dinner). But we may distinctly charge the vegetarians with premeditated cruelty. They pre-

pare elaborate vegetable menus, the universal adoption of which would condemn to starvation several million inoffensive human beings, as any one can see by reading one of the menus. Imagine an Esquimau housewife, rising early to prepare breakfast. Looking at her menu calendar, she finds that the table must be ornamented with violets. The paterfamilias is sent to the nearest ice-floe to gather a bunch. She then discovers that the violet course must be followed by cereal coffee with cream and sugar, cerealine, eggs dropped on buttered toast and whole wheat cakes and maple syrup—all of which would await her liege lord upon his return with the violets. After breakfast dish-washing; then preparations for luncheon, the overture to which is—yellow marguerites, for which the ice-floe must be again invaded. The incidentals to the luncheon are French peas, bread and butter (the latter made from the milk of the female cocoanut), Russian salad, delicate cake and strawberries (the latter, of course, from an iceberg hothouse), nuts and olives, and quince tea or milk. Soon after luncheon Mrs. Chinook sets about preparing for dinner, which consists of tea roses, tomato cream soup, vegetable salad, mashed potatoes, macaroni and cheese, fried bananas (from Greenland's icy mountains), crab apple jelly, and other arctic luxuries, including a tray of fruit and some kumyss. Mrs. C. then informs Mr. C. that breakfast will begin next morning with wild honeysuckle and fresh pineapple. General paralysis closes the scene, unless the family can find quarters in a vegetarian hotel.

DIAMONDS.

A SUGGESTIVE SPECULATION ON THE ORIGIN OF DIAMONDS.

This question which has formed the object of numerous discussions, has been made the subject of a thorough investigation by Daubree. From his report to the French Academy of Sciences we take the following: When the South African diamond fields were discovered, general surprise was expressed at the general geological conditions under which they occurred and which were entirely different from those in Brazil, the only ones which until then were entitled to scientific consideration. Instead of being accompanied by tourmaline, brookits, anatas as in Brazil, the African fields show the precious mineral imbedded in breccia, in which magnesian rocks form a prominent part and where the diamonds are found disseminated in company with a large number of other minerals such as diopsitex garnet, mica, wollastonite, zircone, chronic iron, rutile, apatite, corundum as fragments of slate and granite. These breccia, which constitute a mineralogical museum on a small scale, are found column-shaped imbedded in stratified rocks, as, for instance, black slate, forming a compact mass which on examination appears as a well cemented conglomeration of the above named minerals. Former scientists held the opinion that diamonds had originated in situ. The never missing presence of carbonates in the matrix was considered a proof of this theory. Yet, this view is full of improbabilities. Diamond owes its origin to the place where it is found just as little as garnet and other minerals associated with it and which have been produced at a temperature much higher than the temperature which prevailed when the matrix rose from the depth of the earth. The adamantiferous breccia above described are evidently of volcanic origin, as results from their formation wholly disconnected with all surrounding rocks, which more over are of a different character in all known places, and as results also from the numerous diamond chips disseminated throughout the breccia, their complementary parts being absent. The nature of the accompanying minerals points to much deeper regions as the birth place of the rock. The well-known hypothesis which assigns to diamond an origin from organic materials becomes so much the more untenable. Another circumstance, very little known until now, may be found to offer a high interest. It has been demonstrated that diamond may occur in meteorites. Jeroseieff and Latschinoff discovered in a meteorite, which in 1886 had been observed to fall in the Russian Government of Perm, a fine dusty mass presenting the hardness of diamond and yielding pure carbonic acid by combustion in an oxygen current. This fact called general attention at that time, although an analogy had been established before by the discovery of graphit in rocks of meteoric origin, their crystalline shapes leading the celebrated mineralogist Gustavus Rosi to the supposition that a transformation of diamond might have taken place in this case. The occurrence of diamond in meteorites is rendered even more interesting by the similarity between their composition and the composition of the gangue rocks in the South African fields. These facts allow the inference that in the deep darkness of the earth, which conceals so many mysteries, diamond is by no means of rare occurrence, just as in other planets and celestial bodies. But the earth communicates to us parsimoniously only a few shares of her treasures, not more than what in the course of centuries she may have ejected from her subterranean abysses in many a spot, unknown as yet, and left deposited on their borders.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

June,

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb.

FRUITS.—Cherries, strawberries, bananas, pineapple.

PRACTICAL RECIPES.

ASPARAGUS AND EGGS.—Cut off the violet ends of a bunch of asparagus saving the other parts for soup, stew the ends in water until tender (the water may be saved for soup). Let the cooked asparagus drain. Break ten eggs, add to them three tablespoonfuls cream, beat well. Put a tablespoonful butter in a saucepan, stir in the eggs, then the asparagus; season. Spread some slices of toast, or bread crumbs fried brown in butter, on a platter, pour the eggs and asparagus over this and serve.

MEAT FRITTERS.—Make a batter with a pint of milk, two eggs, salt, teaspoonful baking powder and flour. Mince fine some cold beef or other meat, season with salt and pepper and a small chopped onion. Stir the meat into the batter, fry in boiling lard. Serve with slices of lemon.

POTATO CROQUETTES.—Take some mashed potatoes and form them into egg-shaped cakes, putting in the center of each a small thoroughly roasted onion; cover the onion completely, dip in egg and bread crumbs, fry in boiling lard.

BUTTERMILK FRITTERS.—One pint flour, one pint buttermilk, one egg, not quite half a teaspoonful soda, dissolved in a little water; beat egg separately, sift flour and pour in yolk of egg with milk and a pinch of salt; beat well and add the white of egg last; fry immediately in boiling lard. Take ripe apples and chip up fine and mix in this.

RHUBARB AND APPLE FRITTERS.—Make a batter and to it add some rhubarb and apples thinly sliced. Fry to a fine brown, drain and serve with powdered sugar.

MISS L.'S CREAM PIE.—Yolks of five eggs, one teacupful butter, one pint granulated sugar, one tablespoonful flour, and one pint rich cream. This makes two puddings. You can make a meringue of five whites and put over top, or beat them light and stir in the pie.

ORANGE FRITTERS.—Make a batter as for pancakes. Then take two very sweet oranges, peel, and quarter them. Put some batter into a frying-pan, add some of the orange quarters, and fry. Proceed thus till the batter is used up. Serve with powdered sugar.

LEMON BUTTER FOR CAKE.—Dissolve one cupful of sugar in juice of a lemon, beat three eggs light. Add and mix well. Put a piece of butter the size of a walnut in a pot over a fire. When melted pour over above and cook till thick, stirring all the time.

THE RESULTS OF THE GRIP.

All over this land physicians report that while the grip in an epidemic form has happily passed away, people everywhere are suffering from what may be called after-symptoms, and that these have very often been fatal. To understand this better, we will briefly recapitulate the grip symptoms. These may be divided into three varieties: 1. Nervous, consisting of severe headache, pain in the muscles of the eyes, neuralgic and rheumatic pains, more or less sweating, exhaustion and wakefulness. 2. Gastric, where nose-bleeding, quinsey, nausea, vomiting, constipation, or diarrhœa, or dysentery, occur. 3. Respiratory, where the throat and lungs are invaded; there is pain in the forehead, eyes are watery and congested, profuse catarrhal discharge from the nostrils, hoarseness, general bronchitis and difficulty in breathing. All these varieties may exist in one person so as to make it almost impossible to distinguish them apart, or one set of symptoms may develop to be followed in turn by others. The duration of the grip has been found so variable that no distinct period of termination can be relied on. Relapses and influenzas and many diseases we now find are, no doubt, due to the semi-chronic inflammatory condition left behind. Let us, however, not confound cases of consumption, Bright's disease, or any other grave disorder, with these, since it is well known that the epidemic has intruded itself into any system irrespective of a preexisting malady. Add prostration to that which already exists, and an unfavorable outcome is, of course, to be expected. The long-continued prostration itself is grave and absolutely dangerous, and is a forerunner of extension of inflammation. That in the forehead has been followed by meningitis, and death has occurred in a very short time. General bronchitis has had added to it the capillary form. This occurs oftenest in females. The exhausted system is in about the same condition as that of young children who have been similarly affected. Should this form not remain dry, the patient is unable to expectorate the large amount of secretion in the small tubes nature does not absorb, quickly, and death has occurred in some few cases from asphyxia. But most frequent and fatal of all, where fatal results have occurred, has been pneumonia. It has been lobar, or lobular in form, and generally catarrhal in character. The lower portions of both lungs have been affected. It has occurred more frequently in males. Commencing with a chill, it causes the sub-normal pulse and temperature to become accelerated and increased for the time being, until a profound condition of prostration exists. Even then, of course, most cases have slowly re-

covered, for persistency of all symptoms of the original disease and of its consequences seem to form a prominent feature of the grip. Other symptoms and diseases have probably been met with as sequelæ of the grip; and, in fact, the question naturally arises: Are we yet entirely done with them? Compared with its ravages at its starting place south of St. Petersburg, the grip has been a mild disease in this country; but, from its extensive range, its sudden onset and its multitudinous victims, it may give us plenty of work with its sequelæ for some time to come.

From what has been said, it must be very clear to any one that the after consequences of grip are more to be dreaded than the disease itself, and that this danger is all the greater because of the epidemic features of the malady having passed away, people are lulled into a false security and are apt to neglect what they consider a mere trifling cold until it has made serious inroads and progressed beyond the reach of simple medication. In all such cases the various remedies prepared by Dr. J. C. Ayer & Co., of Lowell, Mass., are of sovereign benefit. Ayer's Sarsaparilla, by removing from the system effete matter, and stimulating the secretions to produce healthy fluids, will put the system in the very best possible condition to rid itself of such impurities as will furnish feeding ground for disease or weaken the system so as to make it less able to withstand the attack. For all coughs, bronchial affections, and kindred ailments, nothing better has been found than Ayer's Cherry Pectoral. And we must not forget to speak of the kindly but efficacious effects of Ayer's Cathartic Pills in cleansing the stomach and bowels and purifying the system.

BUSINESS NOTES.

A BOGUS WEBSTER.

The edition of Webster's Dictionary of 1847 has been reprinted by a Chicago house, copyright on it having expired by the lapse of forty-two years. Only those who are ignorant of the great advances that have been made in dictionaries are likely to buy this reprint at any price. Don't be duped by the flashy advertisements of "The Original Webster's Unabridged Dictionary," which is offered for three or four dollars. A book over forty years old is dear at any price. The latest revised edition is none too good for any one. Buy the genuine, even if it costs a little more, and you will have the cheapest and best book.

Little Johnnie's Prayer.—Sister Lizzie was to be married in a few months and she was putting in the interval of leisure from preparing for the ceremony in the way of dress by experimenting on her family in the cooking line. Little John was going to bed and went through his usual prayers up to the point of saying, "Give us this day our daily bread," when some depressing memory struck him and he added: "But don't let our Lizzie bake it."

Manufactures in Hong Kong.—London *Industries* says that "a very common impression is that Hong Kong is only a mercantile emporium or centre for the distribution of merchandise all over China and neighboring countries. It is, however, developing into an industrial centre of considerable importance. It has now three large sugar refineries, which have practically monopolized the trade of refined sugar in China and Japan. There are factories for ice-making, rope-making, and there is also a company which has a large establishment for supplying bricks and cement."

Artificial Whetstones.—A French technical paper gives the following method of making artificial whetstones: Gelatine of good quality is dissolved in its own weight of water, the operation being conducted in a dark room. To the solution is added 1½ per cent. of bichromate of potash which has previously been dissolved in a little water. A quantity of very fine emery, equal to nine times the weight of the gelatine, and is intimately mixed with the gelatine solution. Pulverized flint may be substituted for emery. The mass is moulded into any desired shape and is then consolidated by heavy pressure. It is dried by exposure to strong sunlight for several hours.

Postal Statistics.—Dry statistics convey a faint idea of the extent of the business of the post-offices in this country, and they are expressed in figures too huge to be grasped. One might, however, compute, as is often done, how many times the postage stamps used in a year, if arranged in a continuous tape, would go from one point to another. There were just 1,961,980,840 of them issued in the year, and any one who has enough idle curiosity to figure it out will find that to represent, roughly, 40,000 miles. There were also 386,808,500 postal cards issued, besides the stamped envelopes and wrappers. One of the most remarkable statements in the report of the Postmaster-General is that there were no less than 115,081,845 money orders issued, showing how largely people avail themselves of this means of forwarding small sums.

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CONTENTS.

THE GALLED JADE WINCING.

Since the United States Supreme Court has rendered the final decision against the unconstitutional State inspection bills, by which it was sought to exclude dressed beef, the agitators who pull the wires behind the so-called National Butchers' Association have sought some new way of galvanizing a dead issue into a semblance of life. They must live, and being too lazy to work, have constituted themselves the protectors of the butchers, at least they would like to have the butchers consider them such, if they can impress the butchers with the idea that there is some big bugaboo, some grasping monopoly, some mammoth ogre, that is going about seeking what butchers it can devour, and that they, the agitators, can defend them and keep these poor little lambs from the clutches of the big Chicago wolves. Of course, it is not philanthropy that actuates these agitators, but a pure and simple idea that the butchers owe them a living, and this living they must have. The more noise they can make, the more imminent, they think, the butchers will imagine the danger to be. The agitators and their one organ have not deemed it wise to refer, in any way, to the important decision of the highest court in the land, which practically says that dressed beef is a commercial commodity, and that the law of the land will protect it. They know better, but they have not ceased to point out every legitimate attempt of the beef-dressers to extend their business, as another step in the process of crushing out the butcher. The latest movement of these hungry and unscrupulous agitators has been to get up a pretended union between the National Butchers' Association and the various butchers' associations with the agricultural interests, including the Farmers' Alliance. This movement will be a complete failure, for the simple reason that the farmers in the Farmers' Alliance are not the farmers who sell their cattle to the beef-dressers, and even if they were would not bind themselves in the supposed interests of the butchers against their own interests. Any farmer will sell his cattle wherever and whenever he can get the best prices for them, and experience has taught him long since that he can get more money in the Chicago and Kansas City markets than anywhere else; and he also knows that the dressed-beef men pay all they agree to in cash, and he is thus secure against loss. As to the effect of such a combination on the purchaser of dressed-beef, it would be like whispering against the wind. Any man will buy meat wherever he can get it best and cheapest, and no argument is needed to prove that dressed beef is best and cheapest. Even the butchers have long since found out that if they do not furnish dressed beef to their customers they will lose them, for other butchers, who are better business men, will sell dressed beef and secure their trade. In this business life, he who does not move with the procession will be run over and crushed under the relentless wheels of progress. This same car of progress, weighted down by the anger of indignant butchers, who will quickly find out the true purposes of these agitators, will also crush them very soon.

COMPOUND LARD.

In the House of Representatives on May 23d, Mr. Wilson, of Kentucky, a member of the Committee on Agriculture, submitted a minority report containing his views on the bill reported by the Committee on Agriculture some time ago, defining and taxing compound lard. It says that there are points involved in the bill of the gravest importance to the vast agricultural interests of the United States, and in danger of being entirely overlooked. From the arguments presented before the committee in favor of the bill, the inference is drawn, the report says, that the immediate result of its enactment will be to increase the value of every hog in the United States thirty-two cents in the farmer's hands. These statements and inferences, the report says, are not clear. The claim that the depreciation in the value of swine and lard is due to the manufacture of lard compound, Mr. Wilson holds, is not, to his mind, established. The greatest injury to the farmer and his hog crop comes from unscrupulous methods of the packing houses and stock-yard buyers' methods, which the honest farmer would not employ, and could not if he would. He says he is very reluctant to endorse a measure like the one proposed, which, he believes, will either increase the price or restrict the sale of a healthful food, and which would do the farmers no good, but the laboring man an injury.

MONEY MAKING.

A question in which pretty much all the world is interested, is the problem of getting rich. That there is no royal road to that species of success is a long conceded fact, and yet, during the past quarter of a century it has been no uncommon spectacle in this country to see vast fortunes piled up in marvellously brief periods, by individuals whose careers at the outset were apparently handicapped by all manner of adverse circumstances. It is easy to account for this by attributing it to "luck"—but after all that is a meaningless phrase,—a mere verbal response, convenient to use in the place of definite explanation. It would seem as though some men possess such natural aptitude for money making that they are certain to accumulate wealth, and often to even re-accumulate it if they encounter reverses. Such men appear to succeed in spite of "luck," for they will rebuild their fortunes after experiencing financial collapses that would drive the majority of their fellow-creatures into hopeless despair. The largest accumulations of wealth, however, especially in our large cities, have been effected through the steady appreciation of real estate values—the "unearned increments," which the Henry George school of radical theorists so vigorously denounce. A writer in one of our recent exchanges quotes a Boston man as saying on this subject: "All the improved real estate in Boston, as a rule, has paid its interest and taxes and quadrupled in value during the past fifty years, while during the same period 90 per cent. of all the merchants and traders in that city have failed, and 90 per cent. of all the business corporations have either done likewise or gone out of business, so that their stock has been wiped out. In view of these facts, I think it may be unhesitatingly asserted that nothing else is so safe an investment for small savings as improved real estate. Nothing is likely to grow in value faster. If you have a rich father who would furnish you with the cash to start you in business, you would probably do better in the long run if you invested it in the way I have pointed out, rather than risk it in trade, meanwhile earning your living by working for salary." This is the point that Mr. Andrew Carnegie dwells upon in his ably written utterances on money making. Its truth is emphatically demonstrated

by numerous wealthy families in Chicago and Philadelphia as well as in Boston, and still more notably by the enormous possessions of several residents of New York whose not remote ancestors had the sagacity to invest in real estate on Manhattan Island. But while these striking illustrations of worldly success are interesting to contemplate, they represent the fortunate outcome of past sagacity rather than point the way to opportunities in the future. Moreover, men's dispositions are so variously contrived by nature that only a limited class are adapted to seek fortune through real estate investment. This diversity of individual inclination is happily the basis of the general success of society. It is the process of evolution constantly developing the homogeneous into the heterogeneous. It would appear that the only path in which wealth can be confidently sought for by the multitude is that one open to every individual —that in which it will be best deserved. Honesty and perseverance in every calling are the conspicuous signposts along the route, and educated skill is the only vehicle that can be safely depended upon to expedite the journey.

LEMON HATCHING.

If full credence can be placed in the news department of the San Francisco *Fruit Grower*, California has not yet reached the summit of achievement in the citrus industries. Our contemporary finds in a Southern exchange information that induces the belief that a new departure in lemon culture may be expected. "A Mr. Osborne, of Ontario, has a hen which has built a nest in his lemon house and managed to rake thirteen lemons into the nest, on which she now sits as hard as if they were the product of her own labor. There is now not only a tariff on lemons, but there is also a hen on lemons, and the New York importers will have to do some pretty hard persuading and use a good deal of money to bribe her. Mr. Osborne is watching the novel prospect for a revision of the lemon industry with much interest, and thinks that it will revolutionize the present tedious methods of propagating nursery stock. If the hen should produce a bearing lemon grove, or a brood of chickens whose caudal appendages would consist of bearing lemon branches, Ontario would become more famous for its production of this fruit than it is now, and it would arouse the jealousy of Pomona, famous for the Murchison letter."

THE MODERN PIANO.

ITS GENESIS, DEVELOPMENT AND STATISTICS OF MANUFACTURE.

(*Continued.*)

There are practically three classes of pianos manufactured. We will begin at the cheapest and describe that class. It is a piano manufactured as cheaply as possible, intended to be sold to any house, who not having the facilities for manufacturing a piano, is content to purchase a ready-made article and have the name of this house stencilled on as the manufacturer. Manufacturers of such pianos have no reputation which they need to protect, they have only to satisfy those who buy their product, and as the real maker never becomes known to the final buyer, assume no risk or responsibility and have no valuable reputation to be injured. If any of these pianos turn out bad, it is only the one whose name appears on the piano who is blamed, and as he probably got from the maker all that he paid for, and the maker used the exact materials and workmanship which he could afford, no one really should be censured but the unscrupulous dealer in such pianos. It is another thing where the makers of this cheap and poor grade of pianos stencil a close imitation of the name of a reputable firm of makers on their work, and thereby fraudulently foist an inferior instrument upon an ignorant purchaser, and not only rob him under the pretense of furnishing a different and more costly instrument, but irretrievably injures the house whose name they imitate by hurting its reputation. Manufacturers of this class of pianos probably make a larger profit on their product and find a readier market; but they do a great injury to a vast industry by furnishing dishonest dealers with the means of imposing upon a credulous public. The inferior pianos sold by them do not in any important way interfere with the sales of the better grade of pianos, because when persons once buy an instrument they are aroused to look about them for better pianos, and thus the cheap class are really incentives to the purchase of better grades. Such pianos as these are made of the cheapest materials, irrespective of quality, in a hasty, superficial manner by unskillful workmen, and with the sole aim and purpose to produce something that will look like a good instrument and sell at the lowest price, say from $125 to $150 at wholesale. In order to thoroughly understand this, we will briefly recapitulate the processes of making a piano and describe the differences between one of these slop shop pianos and a first-class instrument. The men employed by stencil piano makers are generally the offscouring of piano shops, drunkards and tramps who cannot find work in a decent shop, carpenters and cabinet makers who are willing to work cheap and slovenly at piecework, where they can slight the work, rush ahead fast without regard to quality or durability, and can thus earn a livelihood easier than by close application and thorough workmanship. It is in this as in all trades, some men cannot do first-class work, and if they ever could, have lost all taste or pride in their trade and can now only furnish inferior work. They are generally not trades' union men, and cannot gain admittance to their ranks, because no honest, capable workman will allow them to place their work alongside of his, or even by implication admit that they should be paid the same prices. With such men as those just described, the stencil piano manufacturer manufactures his pianos. The foundation of the piano is the back frame with the tuning pin block attached. These are made in first-class shops by men who have been specially trained to it, and of selected and seasoned lumber worth about $60 per 1000 feet. After this lumber has been picked over and the best selected out, the remainder is sold for about $25 per 1000 feet to the stencil piano makers, and of this inferior stuff their pianos are made by house carpenters and framers, but not by regular piano makers. The sounding-board and plate come next. The former is made from spruce. This is divided into what is known as firsts and seconds. The best piano makers use only the former. Stringing comes next. There are imported and domestic strings, the latter being very inferior and much cheaper, and these only are used by the cheap piano maker. These strings are fastened on pins, which are also to be had either imported or domestic, and as over 200 of these are used, the cost makes quite a difference. In securing these, the cheap piano maker drives them with a hammer, the good workman screws them down. The tuning of the piano depends upon these pins, hence the important difference between an imported well made and screwed-in pin and a domestic rough hammered-in pin may easily be seen. Next the case is formed by gluing on the sides, which are already veneered and partly varnished. Good veneering costs six to eight cents per foot, while the kind of veneer put on the cheap pianos can be bought for two cents a foot. The manner of putting on the veneering is very different in the stencil piano from the first-class instrument. In one stencil piano factory the writer has seen a rough sheet of veneering, of the cheapest grade, glued on a piano top with an ordinary corn broom dipped in a large tub of not overhot glue, then pressed down by hand and tied on with strings. After the glue had set, defective pieces were cut out of the veneer and other pieces glued on paper were substituted, the whole then roughly sandpapered was considered a well finished job. In the varnishing and polishing of the case another great difference is discovered. While a good maker will use from six to seven coats of varnish, several of which are rubbed off again, the cheap piano gets three coats and only very superficial rubbing; the varnish, too, is of a grade half as cheap as that which a good piano maker uses. Next the action is put in. These actions are all ready made, but those for the stencil pianos are made by one firm who make a specialty of supplying the cheapest, made by boys of inferior materials, while the better grade of piano makers are supplied by different firms who, making a specialty of this work, have experienced and capable workmen, buy only the best materials, and will not allow an inferior action to go out of their shops. Two or three firms make their own action just to say that everything that is put in their pianos is home-made, but we do not believe that they can make any better action than those who make a business of it, and certainly they cannot make it as cheap. The next process is the action regulating, which means the fitting the parts together so that they will strike correctly and act in unison. This requires great care and time; with the cheap pianos it is hurried over, with the better grade it is done so that the piano will work right, while in a few of the high-priced piano shops it is fussed over and much unnecessary work done. Then comes tone regulating. After the piano has been tuned several times, the hammers are either hardened or softened as they may require, and the same remarks that were made about action regulating apply to this. One great difference between the cheap and the good pianos may be judged from the fact that in one of the stencil piano factories 300 men will turn out 150 pianos per week, while in a good factory the same number of men can only turn out 60 per week. The ivory used for the keys in the good piano is all selected, while the "ivory" keys of the stencil piano are either an inferior grade of ivory or celluloid. We have shown how a piano can be made that will wholesale for $125 to $150 and why such a piano is not worth buying. The fallacious suggestion is sometimes made that a poor piano will answer for a beginner, and when further advanced, a better instrument can be bought. This is wrong, because a poor instrument accustoms a player to false technique, so it is better to buy a good instrument at the first. Among the makers who are said to manufacture this cheap grade of pianos we have described, are the J. P. Hale Co., the Pease Piano Co., Weser Brothers, the Schubert Piano Co., E. G. Harrington & Co., Newby & Evans of New York, and Narvessen of Brooklyn. All of these will put any name on a piano of their make that the buyer desires. No manufacturer whose name on a piano will be a guaranty of quality will put any other name on his product. One firm which existed years ago used to put on their own name as manufacturers for anyone, but even this no reputable piano maker will do now.

(*To be continued.*)

A METAL FOREST.

A MONSTROUS YARN ABOUT AN AFRICAN METAL-EATING PLANT.

The manner in which imaginative Bohemia sometimes amuses itself at the expense of the credulous public, is well illustrated in the following article, for which the Philadelphia *Times* is responsible:

Professor Schelwisch, the well known naturalist of Bavaria, while traveling with the Stanley expedition in the heart of Africa, noticed a plant with a peculiar steel-colored foliage, and on examination it was found that the shrub, although growing like other plants from the soil, was practically composed of iron. The leaves, although very thin, were bent with great difficulty, and the twigs and branches resisted pressure with a force about equal to the same amount of iron, and to secure a leaf it was found necessary to separate it from the bush

with a file. While Professor Schelwisch was digging at the base of this plant for the purpose of making an examination of its roots, the natives crowded around him in great numbers, gesticulating in a menacing manner. The professor desisted from his work and the interpreter was sent for. He explained that this was a holy tree, and worshipped by the natives in their fetich religion as a God plant, and that to dig one up would bring ruin and desolation upon the whole village and surrounding country. Professor Schelwisch offered to buy the plant, and, taking out a handful of copper coins, gave them to the savages, who gladly accepted the money and distributed it among themselves. The Professor then returned to the work of digging up the unique plant, but had not made any great progress when the natives again set upon him. Through the interpreter the Professor informed them that he had legally bought the plant and intended to remove it. As soon as this message was made known to the savages everyone who had received a coin came and dropped it in the hole at the base of the shrub. Professor Schelwisch allowed the coins to remain in the hole and walked away towards the mountain to hunt another specimen. Next day, as the party were preparing to continue the march, the Professor was curious to know if the coins had remained undisturbed during the night by the superstitious natives, and on approaching the metal plant was astonished to find it had changed its color completely. Instead of being a beautiful steel color, the stem, leaves, and what was exposed of the roots presented the appearance of newly coined copper coins and glittered in the morning sunlight like polished gold. Upon examination it was ascertained that during the night the strange plant had absorbed nearly all the copper coins, with the result of completely changing its color. What was left of the coins in the hole showed that they were more than half eaten away or absorbed by the roots of the metal plant. Not only was the color changed, but the texture of the plant had undergone a similar transformation. It was found that the thin ivy-shaped leaves were now easily bent around the fingers, would retain any shape given them, and could readily be cut with an ordinary pair of scissors. Professor Schelwisch succeeded in surreptitiously securing several branches of this wonderful metal-eating plant, and was also successful in obtaining a good photograph of it. No further trace of the existence of the metal plant was found until the expedition reached the Uniamesi country, when at the base of the Nkomabakosi Mountains a perfect forest of this curious plant was found. This being an uninhabited region, no difficulty was encountered in securing specimens to take back to England. A great fire was built about the tree, but it would not burn the least little bit.

ARTIFICIAL ICE.

A SIMPLE EXPLANATION OF ITS MANUFACTURE.

Making artificial ice is an industry that has been carried on in the South for many years. In this latitude it has not been necessary, because nature generally gives us a liberal supply at a very moderate price. During the past winter, however, the weather was so mild that the supply is short, and artificial ice will no doubt be made this season in immense quantities. Few persons understand what the process is. Here is a very simple explanation of it. The apparatus required for making artificial ice includes a powerful engine for driving the pumps, great iron retorts for holding the aqua ammonia, a long system of coil pipes, and extensive vats to contain the ice cans. The process depends upon the capacity of a substance that is expanding, after great condensation, to absorb heat. The substance used in this case is ammonia. Mixed with water it is placed in one or more of the great cylinders or retorts, which contain coils of pipe. Into these pipes steam is sent, heating the contents of the retort until the ammonia is separated from the water and sent into another retort, where it is subjected to great pressure, under which it liquefies. In another room, provided with double doors and walls like those of a refrigerator, are several vats, in which are suspended cans of galvanized iron. Some of these cans are calculated to hold 200 pounds of ice and others are still larger. Between these cans pass lines of iron pipes, connected with the retorts outside, and the entire vat, in which cans and pipes are contained, is filled with brine. In the great condensation to which the ammonia gas has been subjected to liquefy it, it has parted with all its heat, and the large pipes that carry it to the vat are so cold as to be covered with frost. When ice is to be made the cans are filled with distilled water and covered with thick caps. The ammonia is then admitted to the coils running through the brine of the vat. As soon as the tremendous pressure is relieved, by turning the stop-cocks, the ammonia expands into gas, resumes the amount of heat with which it parted when undergoing condensation, and of course extracts it from the surrounding brine. This, in turn, extracts heat from the distilled water, which freezes, as the brine itself would do, were it not saline and kept in motion by means of pumps. In a few hours each can contains a mass of solid ice, and is then hoisted from the vat, dropping for a moment in warm water to loosen the ice, and upset. The block of ice slides out, and is either stored or placed in front of a circular saw and divided into smaller blocks. After the ammonia gas has done its work it is returned to a retort, conducted to its starting place and reabsorbed by water. It can then be used over again, and this process goes on continuously, with some slight waste.

REGULATING DEATH.

HEART FAILURE PROHIBITED BY MUNICIPAL ORDER.

A Chicago dispatch some days ago announced that some of the physicians of that city are indignant because the local Board of Health won't accept death certificates which specify "heart failure" as the cause of death. It seems that since Congress has voted to the Windy City the privilege of holding a World's Fair in 1892 or 1893, more citizens have died of "heart failure" than the Board of Health thinks is proper. The Commissioners decided to put a stop to it. So it has been decreed that hereafter nobody shall die in Chicago of heart failure. When a reporter took this interesting piece of news to the headquarters of the Board of Health and inquired if the prairie town was to be allowed to get ahead of the metropolis in the official rules and regulations governing the operations of the Great Reaper, he received the astonishing information that Chicago was away behind the times, for there hasn't been a death from heart failure in New York according to the records for years and years. Moreover, the physicians of the metropolis are so well drilled in the rules of the Health Department that not one of them will, on any account, allow a patient to die of heart failure. If one of them should, by accident or through ignorance, make such a mistake, he would be brought up with a round turn that he wouldn't forget in a hurry. Unless he should be able to make a satisfactory explanation, showing that after all something else killed his patient, the Coroner would be sent to investigate, and if the victim was really dead that officer would be sure to find that something else was the cause of death. New York has another arbitrary sanitary regulation which is away ahead of anything Chicago has accomplished in this same direction. No citizen of the metropolis between the ages of 2 and 80 years is allowed to die of asthenia, a cause of death which no doubt carried away thousands of people in Chicago. Asthenia signifies exhausted vitality or weakness. It is a cause of death in very young children and in very aged people, when no specific disease is present. If the Board of Health regulations did not forbid it, there is no doubt that persons of all ages would die of this cause, according to the certificates of physicians which would be sent in. The reasons for the strict enforcement of these two regulations by the Board of Health are good ones. As a matter of fact, it would be as sensible to say that a man died of want of breath as to return "heart failure" or "asthenia" as the cause of death. It is true in one sense that every death is caused by heart failure and asthenia. No matter what disease has brought its victim to the point of dissolution, heart failure and asthenia are the final causes of his taking off. It is the business of the Health Department to learn the primary cause, which is, of course, the real cause in each case, and hence its proper refusal to accept the indefinite return, which is, in fact, no better than no return at all. A return of either heart failure or asthenia as a cause of death indicates one of two things—either the physician does not know what killed his patient or he is seeking to conceal the true cause. In either case an investigation should be made. The fact that some Chicago physicians are indignant over the action of the Board of Health of that city is a significant commentary on the class of medical practitioners they have there. This point is emphasized by Dr. Tomlinson, Registrar of Vital Statistics of Chicago, who is reported as saying: "The number of absolutely illiterate and ignorant physicians at present practising in Chicago is simply astonishing." —*Sun.*

ADVICE TO HEED.

THREE BUSINESS CAUTIONS FOR YOUNG MEN.

Mr. Andrew Carnegie gives the following advice to young men: "There are three great rocks ahead of the practical young man who has his feet upon the ladder and is beginning to rise. First, drunkenness, which of course is fatal. There is no use in wasting time upon any young man who drinks liquor, no matter how exceptional his talent. Indeed the greater his talents are the greater the disappointment must be. I do not mean by drinking liquor, the taking of a glass of beer or wine at meals. It is not necessary for a man to be a total abstainer in order to be temperate. The rule should be: never enter a bar-room and never drink liquor except at meals. The second rock ahead is speculation. The business of a speculator and that of a manufacturer or man of affairs are not only distinct but incompatible. To be successful in the business world, the manufacturer's and the merchant's profits only should be sought. The manufacturer should go forward steadily, meeting the market price. When there are goods to sell, sell them; when supplies are needed, purchase them, without regard to the market price in either case. I have never known a speculative manufacturer or business man who scored a permanent success. He is rich one day, bankrupt the next. Besides this, the manufacturer aims to produce articles, and in so doing to employ labor. This furnishes a laudable career. A man in this avocation is useful to his kind. The merchant is usefully occupied distributing commodities; the banker in providing capital. The third rock is akin to speculation—endorsing. Business men require irregular supplies of money, at some periods little, at others enormous sums. Others being in the same condition, there is strong temptation to endorse mutually. This rock should be avoided. There are emergencies, no doubt, in which men should help their friends, but there is a rule that will keep one safe. No man should place his name upon the obligation of another if he has not sufficient to pay it without detriment to his own business. It is dishonest to do so. Men are trustees for those who have trusted them, and the creditor is entitled to all his capital and credit. For one's own firm, "your name, your fortune, your sacred honor;" but for others, no matter under what circumstances, only such aid as you can render without danger to your trust. It is a safe rule, therefore, to give the cash direct that you have to spare for others and never your endorsement or guarantee."

CORRESPONDENCE.

FLOWERS AND FASHION.

LONDON, *May* 20, 1890.

Editors AMERICAN ANALYST:—The London fashionable season is just beginning its toil and whirligig, and before the month is over there will be dinners on dinners, balls on balls, and receptions without end, each one trying to outdo the other either in floral decorations or in viands of the costliest. At nearly all the dinner-tables the bon-bons are made to match in color the prevailing tone of flowers and lamp shades on the table. Fuller's American sweet-shop in Regent Street is, I believe, the only place where the sweets are made to match accurately. At a Primrose Habitation meeting last month, we noticed at one of the coffee and tea tables held by dames of the league, one that was especially charming. In the centre of the table was a huge cushion entirely made of primroses. It was laid on a piece of Chartreuse-colored plush to throw it up. In the centre of the cushion was a crown of forget-me-nots; on each side of it were sheaves of primroses, tied with forget-me-not bands; beyond that were some small horse-shoes filled with the same flowers; circlets of them were arranged round fancy cakes; the cups and saucers were primrose color; on the wall behind was an escutcheon of primroses, with a scroll underneath in forget-me-nots. At a large reception the other night the decorations were entirely of shaded pelargoniums and ferns. The mirror over the mantel had a high posy of them and grasses stuck at the top hanging down one side; and on the opposite lower corner another posy. From the top posy hung down, festooned as a curtain, all kinds of feather grass, which hung down one side only; each corner of the room resembled three-tier whatnots made of pelargoniums. These were red at the base, then came pink, then white, all apparently growing out of moss and fern. On the walls were lyres made of the same flowers, and on the staircase, where a mirror stood with a sofa in front, two huge palms were placed, one on each side, and met like an arbor overhead. A few butterflies and humming-birds were cunningly hid here and there among the foliage. On a console table by the stairs was a huge moss cushion with a most exquisite spray of rare orchids laid across it; it was indeed a delicious feast for eyes. The banisters were all draped with Liberty muslin, and tied here and there with large bows, with long ends of rose-colored ribbon. The sideboard in the supper-room was very much bedecked with flowers; wreaths of pelargoniums were garlanded from one side to the other of the top, and large posies standing in silver cups stood on the buffet between the elaborate dishes thereon. At another ball everything was yellow. Amidst the towering palms, genistas peeped out here and there. Jonquils were the flowers of the evening; bunches of them, tied with Chartreuse-colored ribbon, were placed on the banister rails. In a corridor was a bank of jonquils shaded by palm trees. A fountain was playing in an ante-room, with an electric light above it, and by some chemical process every now and again the water seemed to be changed to every color of the chameleon. The ices served in the refreshment rooms were in the shape of pink and white roses. In the dining-room was introduced a champagne bar with all the best-known brands, and the guests asked for whichever they liked, and glasses were put under and the wine drawn out in the same manner as beer is at the restaurants. Iced tomato sandwiches were much to the fore at supper time, and very good they were. There was nothing very extraordinary in the supper dishes, because all culinary work is becoming such a high art and so wonderfully decorated that it would be difficult to find anything to describe. Maritime jellies seem very fashionable, as well as forcemeats in all sorts of guises and shapes and surprises.

D. S.

WOMEN'S WORK.

LIST OF FEMALE LAWYERS AND NOTARIES IN NEW YORK.

From an article in the *World* concerning the female disciples of Blackstone, we learn that of the five women graduates from the law department of the State University of Iowa, Mrs. Anne N. Savery, now a resident of New York, took her degree in 1875, being soon after admitted to the Bar. This student graduated in the class with Mrs. Mary E. Haddock, who took an extra year's course, and being for several years appointed by the Supreme Court to examine students of the University for graduation and admission to the Bar. In being admitted to the Iowa Bar, Mrs. Savery had no intention of practising law unless in the case of some poor woman without money who might be aided by her services. While favored by worldly possessions, and with her husband holding large business interests in the West, this member of the legal profession lives quietly in her home at Central Park West and Sixty-Second street. To New York came also the first woman graduate from the Howard University, Washington, Mrs. Charlotte E. Ray (colored), who received her degree in 1872, and was admitted to the Supreme Court of the District, there engaging in practice. While spending some time in this city, where her mother resides, she was not in active practice, but is reported as having resumed work at her profession. To women engaged in the law, as they now are in considerable numbers in different parts of the country, this city probably has the aspect of an uncivilized domain. So little advantage has been taken of the Act of the Legislature in 1886 giving women the privilege of admission to the Bar in this State that the majority of the people, and even some of the lawyers, are not distinctly aware of its having been passed. In the East as in the West women are more largely availing themselves than here of the opportunities given for the study and practice of the law, Boston University having now eight women students in its law department, while some of its graduates are well established in the legal profession. In this State women have not been enrolled in the law schools making no distinction of sex. The Buffalo Law School and the law school of Cornell University are of this class. Of the initiatory efforts of Dr. Emily Kempin to establish a school of law for women in this city the story has been told. At this stage new features are in development, with much expected from the work of an association which has been formed. No less than thirty-five applications are reported as coming from women who desire to enter the school. Among the active friends of the movement are such men as Mr. David Dudley Field, ex-Judge Noah Davis, Mr. Daniel G. Thompson and Mr. Jacob F. Miller, with many women of influence in Brooklyn as well as in this city. The preparation of Dr. Kempin for the work undertaken is of a thorough kind. As the first woman graduate from the Law School of the University of Zurich, Switzerland, she received her title of Doctor Juris Utriusque about three years ago, being yet a young woman. She is the wife of a clergyman and has three children. About thirty women in this State hold the civil office of notary public, of which the bestowal is primarily dependent on a Senator's recommendation. Not far from a third of the whole number having these appointments are in this city, being engaged chiefly as stenographers. The first woman to receive the commission of notary public was Mrs. Jennie Turner Powers (then Jennie Turner), whose appointment, coming originally from Gov. Cornell, has been renewed for successive terms. Her office is in the Mutual Life building, and she is well and favorably known. After a hard battle lasting over a year an appointment as notary public was won from Gov. Hill by Mrs. Emma D. Mills, of the Equitable Building, who has had an office for two terms and was recently reappointed for the next two years. She is also a commissioner of deeds for some of the States and is seeking the office of bank notary. Another woman notary public, Mrs. May Carr Gulic, is in the same building, where also is one of the four offices of Miss Mary A. Seymour, notary public of New York County, President of the Union Stenographic and Typewriting Association School, publisher of the *Business Woman's Journal*, Commissioner of the United States Court of Claims, and Commissioner of Deeds of New Jersey. In the Potter Building, where Miss Seymour has her main offices, a girl notary, Miss Carrie A. Barrett, is engaged in the law office of Ex-Senator Thorn, through whose recommendation she obtained her appointment. Although frequently a convenience this office is not sought as being lucrative. A renewal of the commission of notary public, extending the same to 1892, was issued a few days ago to Mrs. Ella F. Braman, who has a Broadway uptown office. The holder is in the fifth year of this course of business with a district enlarged to seven counties. For eight years she has been a commissioner of deeds, this office being now held for all the States and Territories, with the addition of Canada and several foreign countries. She is also a commissioner of the United States Court of Claims and a passport agent, being an exceedingly busy as well as a competent woman. Her office is equipped with a long-distance telephone, four typewriters and other inventions. In serving papers on parties seeking to evade process, women have yet all the advantage of the novelty of such a course, being generally unsuspected of any law-directed intent. The reputable detective officers of New York all have feminine "operators," as they are called, who are engaged in such business. One of the most successful of these is a married lady residing in Brooklyn, who has been employed by the Pinkertons for the last fifteen or twenty years. Notwithstanding the fact that she has been engaged to secure evidence in every class of cases, it is her boast that she has never been called upon the witness-stand, and will never undertake any work unless this is agreed upon beforehand, her information being followed up by others.

PROGRESSIVE PIPES.

A NEW FASHION COMING IN AS A SUBSTITUTE FOR CIGARETTES.

Society, according to that well informed society organ, *The Sun*, is beginning to rebel against cigarette smoking. To do away with cigarette smoking something more fashionable must be devised to take its place. One attempt was the smoking of imported cigarettes, but with the exception of the quality and the fact that the imported cigarettes cost ten times as much as the domestic ones, there was no improvement. It is hard for a man who has been accustomed to smoking cigarettes to change to the smoking of cigars. One of the great features of cigarette smoking is that their smoke is inhaled. Cigar smoking is different from cigarette smoking, and the man who has been used to inhaling cigarette smoke cannot get the same pleasure from the inhaling of cigar smoke. Neither is it as easy for him to inhale cigar smoke. Just as the odor of cigarettes offends most of the smokers of good cigars, so the odor of a good cigar is most repellant to the habitual smoker of cigarettes. Fashion has devised a way to avoid cigarette smoking and to do away with it in a costly manner and one not so offensive. It is a reversion to clay pipes. Not the ordinary clay pipes that sell two for a cent, but French clay pipes that cost from seventy-five cents to $10. These pipes are much the same as the old-style clay pipes. They have a stem from two to five inches long, a little tip at the end, and a bowl. The bowl, though, does not hold any more tobacco than the average cigarette. It is about one-quarter of the size of the usual clay pipe. On the stem are stamped some letters showing that the pipes are manufactured in Paris. They have the French trade mark. These pipes

cost ten cents each, retail, or half as much by the quantity. Any man who intends to smoke them in the fashionable manner must buy a quantity. With the pipes is bought an amber and silver-tipped mouth-piece. This is two or three inches long, and is what costs. A pipe is not intended to be smoked more that at one sitting; then it is to be thrown away and a fresh one inserted in the holder in its stead. This looks fastidious, costly, and fashionable. The pipes and the holder go in a Russian leather case lined with pink silk and stamped with French names. The pipe rests in soft blue velvet. This is pretty, and more fastidious than cigarettes. It cost more than cigarettes and is not so offensive or injurious. It does no more harm than smoking an ordinary pipe and is probably less harmful, as less tobacco is smoked. There is no paper, mucilage, or anything except the tobacco put into the pipe. Though the fashion is so recent, imitations of it have begun to appear, and the pipe without the silver mouth-piece can be bought for seventy-five cents. It is a dainty thing to smoke one of these pipes two or three times and then throw it away. It may even become good form to smoke one of these pipes on the street and then throw it away, like a burnt cigarette or a cigar butt.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

June,

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb.

FRUITS.—Cherries, strawberries, bananas, pineapple.

PRACTICAL RECIPES.

SAGO SOUP.—Soak one-half cup of sago in cold water for three hours; drain and put it in the soup pot, with a small onion, a little parsley, and one quart white stock or veal broth, and let it cook gently for about half an hour; heat two cupfuls of sweet milk to the boiling point, thicken it with one tablespoonful of butter and two of flour rubbed together; remove the vegetables from the soup, add the milk to it, season and serve.

QUEEN CAKES.—One-half cup butter, one-quarter pound powdered sugar, one-half pound flour, one-quarter pound currents, two eggs, one-half teacup rich milk or cream, one teaspoonful baking powder, lemon flavoring; beat well for ten minutes or more, and bake in small buttered tins for tea.

CUCUMBER FRITTERS.—Cut the ends off a straight cucumber, cut it in two, peel, remove the seedy part, fill with sausage meat, cut into quarter-inch slices, dip them in flour, then in batter and fry in hot lard.

BEEF AND PARSNIP PUDDING.—Cut thin slices of cold roast beef, boil, and mash some parsnips, with a little butter, pepper and salt; line a pudding mold with paste made with butter or suet, put in it a layer of the meat, season well, then a layer of the parsnips, another of the beef and so on; cover with paste, put on the mold top and boil.

EGG FRITTERS.—Boil four eggs hard, pound them to a paste, with one-quarter pound beef marrow, a little cream; pound four macaroons, a little sugar, some bitter almonds and a little lemon peel; mix with the eggs, form into fritters, dip in batter; fry in hot lard and serve with powdered sugar.

RICE CAKES.—Soak one-half pound rice over night; in the morning boil it soft, drain it, mix one-quarter pound butter with it and set it away to cool; when cold add a little salt and one quart milk; beat six eggs and stir them into the rice alternately with one-half pound flour; beat all thoroughly, form into little cakes and bake on a griddle; serve as hot as possible.

BREAD PUDDING WITH RAISINS.—Stone one-half pound raisins and stew them; soak some stale bread in milk; butter a pie dish, put in first a layer of bread, then a thick sprinkle of raisins, then another layer of bread; over all pour a cupful of sweet milk, add a few bits of butter and bake.

SPONGE CAKE.—Six eggs, their weight in sugar and half their weight in flour; grated rind and half the juice of a lemon; bake about three-quarters of an hour.

BAKING BY ELECTRICITY.

HOW FLOUR IS GRADED FOR THE PURPOSE OF UNIFORM BRANDING.

The millers sell flour under different brands, and doubtless many housewives have wondered how the grade of each brand continued uniform, generally making bread of the same quality. A visit to the "dough room" of the big Pillsbury (Minn.) flour mills would reveal the secret. Piled all along the room are little pasteboard boxes, each filled with wheat or flour, and each bearing a label. The "dough man" takes the half-pound of wheat in one of the boxes, puts it in a small hand-mill and grinds it. The bran and starch are quickly washed out, leaving the gluten, which is worked into a sort of paste. This is baked in a small oven, and the height to which it rises determines the value for breadmaking of the consignment of wheat of which the handful ground was a sample. When the attention of Electrician Hughes, who has charge of the electrical plant of the mill, was attracted to this baking oven he observed that it took a long time to heat it to the baking point, by means of the oil lamps under it, and he at once formed the idea of baking the gluten by electricity, with the result that he has just applied for a most interesting little device, which, in its way, is quite a wonder. The millers have always had trouble to secure an oven that would do this work satisfactorily, and the best one they could buy came from England. It is about fourteen inches in height, with a cement bottom two inches in thickness, and a door twelve inches high. It took one hour and forty minutes to heat this oven to the 500 degrees Fahrenheit necessary for baking the gluten, and then when the large door was opened to put in the gluten about 100 degrees of heat would be lost, and it required fifteen minutes to bake the dough. In the Hughes oven the small piece of gluten is placed in a cylindrical brass case, about an inch in diameter, which in turn is placed in the oven, also cylindrical in form, and under a heat of 500 degrees, the gluten is baked in four minutes, the entire operation of heating the oven and baking requiring less than twelve minutes. The test of the gluten is in the height to which it will rise. In the little cylindrical tube is placed a plunger bearing a weight of $11\frac{1}{2}$ ounces pressed down closely on the gluten, which in rising carries the weight upward. The higher it lifts it in the tube the stronger are the bread-making qualities of the wheat from which the gluten was taken, and the milling of the proper proportions of the different grades of wheat, as determined by the gluten tests, produces the required standard of flour. It is in this way that the brands are kept even. Mr. Hughes simply connects his oven with the regular electric current in the mills, and acquires the desired result without tiresome and expensive delay. His oven is now in use in the Pillsbury mills, and is giving the best of satisfaction. It can be heated to 680 degrees.—*Minneapolis Journal.*

AMATEUR PHOTOGRAPHERS.

SOME USEFUL PRACTICAL HINTS FOR BEGINNERS.

Thanks to modern improvements, the fascinating art of photography can now be practiced by anyone, no previous knowledge of chemistry being required, and excellent outfits can be obtained at all prices, from five dollars upwards. A few hints to those intending to join the ranks of the "photograph fiends" may be of service. We should advise the beginner to start in a small way, with comparatively cheap apparatus, and proceed step by step, buying additional apparatus as it may be found necessary. The amateur who attempts the first day he receives his camera to take a landscape view in the morning, an instantaneous picture after dinner, a portrait in the course of the afternoon, and a flash-light interior in the evening, will surely come to grief, and consider all amateur photography to be but vanity and vexation of spirit. Nothing is better to commence with than an architectural subject—the amateur's residence, for instance—and in a few trials, the first of which will undoubtedly be failures, he will gain an immense amount of information regarding time of exposure, management of the camera, use of the diaphragms, etc., which will be indispensable to his further progress. Taking everything into consideration, we would recommend the 5x8 size of plate as the best to use. It is easy to handle, and gives a picture in which the details are large enough to be distinct, while prints of this size when mounted are of a convenient size to examine and not too large to lie around the house. Larger sizes are adapted to particular cases, while apparatus for taking smaller views only has the advantages of greater portability and slightly less cost. An excellent 5x8 outfit can be obtained complete for about twenty-five dollars, and is recommended as the best to commence with. As one gains experience and interest in the art—and the interest always increases at a very rapid rate—better apparatus can be substituted, to any extent that one's purse will allow, and the old apparatus sold at a small discount to some other beginner. Of course the most important part of the apparatus is the objective, or lens, and a good one should be procured before anything else. A strictly first-class photographic objective for the above size will cost from twenty to fifty dollars, although the single view lenses sold with the cheaper outfits are often most excellent, and give very satisfactory results. "Wide angle" lenses are indispensable for interiors and many out-of-door views in confined situations, but the rectilinear landscape lenses are the best, we think, on the whole, for such duties as the average amateur is likely to require of them. A very common mistake of beginners is to stop the development too soon. When a properly exposed plate is placed in the developing solution, the image soon appears and is, apparently, perfect in all its details. The temptation is strong to remove it at once and wash off the developer; if this is done, the negative after it is fixed, will be thin and lacking in detail, and, in fact, quite worthless. The development should be continued until the image nearly disappears, and the plate seems to be spoiled. But it is not, and an immersion in the fixing bath will bring out a brilliant negative of the necessary intensity to make good prints. It is not worth while to experiment much with different developers. There is nothing much better than the ordinary pyrogallic acid and carbonate of soda, and the average amateur does not usually care to trouble himself about the refinements of the art. It is better to become accustomed to one solution and use it constantly, when uniform results will usually follow. The same principle will apply to plates. The leading brands are all about

equally good, and there is nothing gained by constant change. No instruction in photography can take the place of practical experience. There is a sort of "knack" in the various manipulations which can only be acquired by practice. The first attempts of the photographic amateur are pretty certain to be accompanied by much trouble and anxiety, and result after all in a dismal failure. If one does not forget to pull out the slide, remove the cap, or take two pictures on the same plate, he will do well, for there is as much nervousness accompanying the taking of the first picture as in landing the first trout or shooting the first deer. Practice will soon make perfect, however, and patience and perseverence will enable one to obtain photographs which will be things of beauty and joys forever—or, at least, until they attain what seems to be the ultimate destiny of all silver prints, and fade away into oblivion.—*Pop. Science News.*

BUSINESS NOTES.

NON ANGUIS IN HERBA.

* A Slander Exposed.—A knowledge of what the physician is prescribing is absolutely essential for the correct application of therapeutics. This accounts for the great demand for Bromo Soda, the formula for which is published. A competing firm has perpetrated a slander upon the Medical profession and the Pharmacists, in claiming that their preparation of Caffeine is imitated and substituted. They are too cowardly to give the name of the firm, nor do they state the composition of the remedy they are advertising, how, therefore, could there be an imitation practiced? The assertion is a slur on the intelligence of the profession. Bromo Soda was originated and introduced by us, Bromo Chloralum by another firm, hence they can claim no exclusive right to the title "Bromo." How could the doctor be expected to do otherwise than prescribe Wm. R. Warner & Co.'s Effervescent Bromo Soda, containing Bromide Sodium grs. 30, and Caffeine gr. 1, in each dessertspoonful as made known, or Warner's Bromo Potash 20 grs. and Caffeine 1 gr? Hence we say: "No snake in the grass," meaning that ours are not secret remedies, but such as the doctor can use with confidence and with better and more certain effect. They are prescribed in dessertspoonful doses in half of a goblet of water, and taking while effervescing. In all cases of headache, migraine, insomnia, nervousness, etc., specify Bromo Soda or Bromo Potash (Wm. R. Warner & Co). To avoid disappointment accept no substitutes.

If the firm using this language had a spark of commercial honor above that small modicum represented by dollars and cents, they would be ashamed to engage in such questionable practice. Let this be a "Warner" against all other Bromos.

WILLIAM R. WARNER & CO.

* "Their travelers and representatives corrupt druggists by persuading them to use cheap substitutes. *We ask our medical friends to see that this fraud is not practiced.*

IS IT TRUE?

It has been publicly stated that the Lavender Salts and the Crab Apple Blossoms so extensively advertised as made by the Crown Perfumery Co. of 177 New Bond Street, London, are put up in New Haven, Conn. We cannot understand why as good perfume cannot be made in New Haven as in London, but presume that our *Jeunesse doré* prefer anything "that is English you know," and the manufacturer is willing to concede such a trifling point.

A NEAT ADVERTISEMENT.

Messrs. James Pyle & Son, the manufacturers of the celebrated Pearline, have issued some beautiful lithographed cards representing a torn envelope having an imitation postage stamp and post mark in the corner, addressed "U. R. Suretofind Enclosed Advice O. K." On the reverse side is the common sense statement of what Pearline does and wherein its superiority consists. The whole style of this unique advertisement is far superior to the trashy cards so frequently used by business houses.

Ink for Glass.—An ink that will write on glass can be made from ammonium fluoride dissolved in water and mixed with three times its weight of barium sulphate.

A Trade School.—Work is being pushed actively on the building for the I. V. Williamson school for the mechanical trades, which will be located near Philadelphia, Pa.

Scriptural Values.—Biblical units have the following equivalents: A shekel of gold was $8. A firkin was 7 cents. A talent of gold was $13,809. A talent of silver was $538.30. Ezekiel's reed was nearly 11 feet. A cubit was nearly 22 inches. A bin was 1 gallon and 2 pints. A mite was less than a quarter of a glass. A shekel of silver was about 50 cents. A piece of silver, or a penny, was 13 cents. A Sabbath day's journey was about an English mile. An ephah, or bath, contains 7 gallons and 5 pints. A day's journey was about 23½ miles. A hand's breadth is equal to 3⅝ inches. A finger's breadth is equal to 1 inch. A farthing was 7 cents.

A BUSINESS BENEFIT.

ADVANTAGES TO ADVERTISERS OFFERED BY THE AMERICAN ANALYST.

It has not the limitations of a daily paper. No one reads yesterday's paper. A monthly lives at least a month, while a weekly is fresh four times a month, and its audience is not limited by geographical lines, but the circulation is all over the United States and Canada.

It contains matters of interest to everyone, especially the ladies of the household, and is, therefore, sure of a careful perusal. Our audiences are intelligent and of the better classes, who have money to spend, and any well worded advertisement in our columns, giving real information, will receive a careful perusal.

Our rates are as low as our circulation affords. Large circulation and original matter cost money, and those advertisers who desire to realize these benefits must expect to pay reasonably for them.

Advertisements in our columns are permanent. Most of our subscribers bind their numbers.

Our advertisements are set up in an attractive form, sure to call the attention of the reader.

Anything that our readers want, or for which a demand is to be created, not wholly of a local nature, will pay to advertise with us.

We take only advertisements from legitimate houses of really meritorious goods, and give them all the editorial assistance they deserve; consequently our readers knowing this, have confidence in advertisements contained in our columns.

The fact that we have the best and largest houses in every branch of trade advertising with us, and that they always renew as their seasons arrive, proves beyond a doubt that they have found the **American Analyst** a good advertising medium. Why should not you?

AMERICAN ANALYST

A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

ABOUT BRIGGS.

We publish in another column an extract from the *Musical Courier*, of this city, in which a lame, because unjustifiable, attempt is made to discipline the American Analyst for alleged shortcomings in connection with the pianoforte discussion. As the *Courier* is not on our exchange list, and as we have vainly sought for it at the news stands in our vicinity, we have failed as yet to see the previous article referred to in the opening paragraph. We have no doubt, however, that our contemporary attempted in it to give us some salutary advice. Not having had the benefit of this advice, nor having had the *Courier's* ten years' experience in "bidding for the patronage of the music trade," it seems, according to that journal, that we have fallen into various blunders, especially the very serious one of not having "worked with the *Musical Courier* in exposing the stencil fraud," as we are erroneously alleged to have promised to do. Our misfortune in not having seen the *Courier* also prevented our knowing of the valuable aid promised us in "our good work of getting advertisements from the piano houses." The same deprivation further spared our feelings, which would probably have been seriously excoriated had we seen the criticism of our initial paper on the piano. All of this avalanche of fault-finding is brought forth by a letter which was sent to the *Musical Courier* by C. C. Briggs & Co., of Boston, whom our contemporary characterizes as "one of the cleverest advertising concerns in the trade." Whatever that may mean, it does not convey any definite idea regarding the quality of the pianos made by Briggs & Co., for if the adjective "cleverest" is intended to be complimentary, it could with greater force apply to the worst stencil house in the country, because clever advertising will sell a poor, cheap piano quicker than it will a good, expensive one. However, let the *Courier* settle that with "Briggs," as it disrespectfully calls the Boston firm. That clever advertising concern seems to have taken umbrage at our proposed exposure of the stencil fraud, while we were advertising one house which they allege deal in stencil pianos. According to Briggs this course on our part shows that we either don't know what we are talking about or that we must be venal. But it seems to us that in thus complaining to the *Courier* Briggs is, unconsciously or otherwise, treading on that journal's toes. The *Courier* is certainly expected to know all about the piano business, and yet it regularly advertises at least two of the best-known stencil piano makers in the trade. While not claiming to know everything concerning the piano business, we emphatically assert our right to insert any advertisement in our columns which does not violate the law or public morals. We respectfully suggest, however, that when Briggs rushes into print he should confine himself to the truth. Instead of that, he purposely misquotes us and our advertising department's letter to him. While our advertising and editorial departments are kept entirely separate, we always insist upon correspondence emanating from this office being grammatical and free from slang. Briggs puts slang into our letter, and then adds insult to injury by impertinently commenting upon the letter, although in the same sentence he admits that, not being interested, it is none of his business. Now a word to the *Musical Courier* in a neighborly way. Our contemperary evidently forgot that it is only a technical trade paper published to reach the trade and not the general public. As the trade thoroughly understands the piano business, it would not look to the *Musical Courier* for any instruction on what stencil pianos are. If it did, it would look there in vain, for the *Courier's* columns have never contained anything about stencil pianos except trite generalities and caustic accusations against individuals. On the other hand, the American Analyst is published to instruct the public, to which the piano trade is compelled to look for purchasers. We have looked in vain in the files of the *Musical Courier* for any information that would be really instructive and useful, and had, in our search for the truth, to depend upon our own resources. We interviewed the manufacturers, carefully compiled the facts, and laid them before our readers in our preceding and present issues, and in thus telling the truth in an intelligent manner we have given needful information to the public and rendered real service to the honest manufacturer. Whether the manufacturers whom we have thus served and whom we shall continue to serve in all things which may be to the interest of the public, will think that it will pay them to patronize our advertising columns and thus draw the awakened attention of the piano buyers whom we reach to their several wares, is a matter we leave to their business sagacity. We have certainly done all that we agreed to do, have done it without fear or favor, and we sincerely believe that we have the approbation of all but Briggs and the *Musical Courier*. And who knows but these may yet see the error of their ways? Our esteemed contemporary may be able to do some good, do credit to its columns and confer a benefit on its readers by reproducing our articles in its pages.

BORROWED NAMES.

News comes from Germany that the vineyards in the valleys of the Rhine are being devastated by worms which infest the vines in such numbers that their extermination is impossible. It is estimated that hundreds of thousands of vines have already been destroyed, and the destruction of the entire crop is threatened. This seems to portend a scarcity of Rhine wines, but no fear need be had on that score. There are plenty of California wines which will be labeled *Deidesheimer*, *Niersteiner*, *Duerkheimer*, &c. These wines so labeled are all right enough, but why should they not be labeled for what they are. A rose by any other name, smelling just as sweet, does not seem to find application here.

FOREIGN BEEF SHIPMENTS.

In the U. S. Senate on June 9th, Senator Vest, of Missouri, brought up his bill to break up what he terms the dressed beef monopoly. The bill has already been referred to in the American Analyst. It provides that no clearances shall be granted to any vessel plying as a common carrier from the United States to a foreign country, the owners, agents or officers of which shall refuse to receive in the order in which they may be offered, said vessel having storage room for same, any cattle for transportation to a foreign country, the said cattle being in sound condition suitable for transportation, the shipper tendering the reasonable freight therefor, or who shall make any contract or agreement creating a monopoly of the capacity of said vessel for carrying cattle in violation of the law governing and regulating the duties and obligations of common carriers to the public and prohibiting unjust discrimination between shippers. Senator Vest made a strong argument for the

bill as necessary to break up the existing monopoly in transportation. Some keen questions were put to him by the lawyers on the opposite side, and Senator Hale, of Maine, offered an amendment exempting from the operation of the bill contracts already made. Senator Vest maintained that this would nullify the entire purpose of the bill, as a few individuals had contracts for every foot of storage room in the cattle vessels. The Senate adjourned, however, without further action.

ELECTRICAL SPEED.

The probability of electrical power ultimately superseding that of steam for the propulsion of public conveyances, is confidently maintained by a majority of our electrical experts. We have not, however, seen the proposition more concisely expressed than in the following declaration of Prof. Elihu Thomson, in his discussion of "The Problems of the Future," published in a recent magazine: "In the near future railways will be run by electricity; not the small roads, I mean, but really the large ones connecting cities, and there is no reason why we should not expect higher speeds than we can attain at present with our steam locomotives. There we have reciprocating parts that must be put in motion, stopped, and reversed continually, while in the electric locomotive we have the simple rotary motion, which is all we need, which makes it possible accordingly to run at a much higher rate of speed. Although the steam locomotive has been very much improved, yet it can hardly compare with the economy of stationary engines, placed where they can have an abundant water supply for condensing purposes. We can, therefore, by employing stationary engines and electric roads, do away with a great deal of unnecessary weight, and the moving parts being symmetrical, we can attain a much higher speed, say a hundred miles an hour. This would be a grand step forward, which would save us a great deal of time. It might even be possible to reach a speed of 150 miles an hour. It simply depends upon finding the method of applying sufficient power, and building the locomotives to suit, arrangements being adopted to keep the cars on the track."

BUSINESS IS BUSINESS.

It is a great mistake that impulsive business men occasionally make, to take the conditions of a contract or engagement for granted, leaving their definite adjustment to be determined when the time of settlement arrives. Such a course either indicates an uncertainty in the motives of one or both the contracting parties which involves the whole transaction in risk, or it implies the existence among them of a romantic confidence that experience rarely justifies. Business is never properly conducted on a sentimental basis. Give and take is its fundamental principle, and the daily struggle of the active man of affairs is, within established limits, to take as much as possible and give the least that is practicable in return. It accordingly behooves a man when he undertakes to exchange with another his substance or personal efforts, to have a distinct understanding at the outset as to the amount of such substance or effort he is to receive in return for his own outlay. When that is neglected it is either because of business incapacity or because of some concealed purpose hostile to the terms of the transaction. When a man says: "That will be all right; we won't have any trouble about that part of it," it may be confidently assumed that there will be trouble about precisely "that part of it." Similarly, when a man declares "You'll not lose anything by this; I'll see that it's all right," it is pretty certain to be all wrong in the end. When it is impossible to determine the exact value of mens' services at the beginning, the end is more than likely to be misunderstanding and mutual dissatisfaction. It is never safe to make engagements in a lax way. The probable value of every transaction can always be estimated beforehand with sufficient accuracy for the framing between the parties of a definite agreement. When such an agreement is impracticable the transaction might better be left untouched.

THE MODERN PIANO.

ITS GENESIS, DEVELOPMENT AND STATISTICS OF MANUFACTURE.

(*Continued.*)

So far we have only spoken of the stencil piano and compared it with the better grades of instruments as generally made by first-class piano makers, but there is still another class of pianos, namely, those high-priced instruments of such makes as Steinway, Chickering, Knabe and Sohmer, who on an average charge about double for their pianos what a first-class instrument can be bought for from good and reputable manufacturers. There must, of course, be some way of accounting for this. The old stereotyped "paying for the name" will not explain it. Why should a buyer pay double for a piano, apparently the same as another, which he can buy for half the price? Ask the makers of these high-priced pianos, and they will tell you that they sell you a better instrument, but do not itemize wherein their claimed superiority consists. If pressed they will say that they pay better wages for better workmanship. As the trades-union scale of wages for week work is the same in all shops, the only explanation of this is that in these shops where high-priced instruments are made the workmen are instructed to spend more time upon their work. Makers of medium grades say this is unnecessary, that they use all the time and care necessary to make a first-class instrument, and that they could not if they would improve on the quality of the insides of the piano. However, the makers of the high-priced instruments do use more time and care, and must be paid for it. Again, they season and kiln their own lumber, and claim that the time and risk of checking and deterioration must be paid for. The medium-priced makers say that they can buy just as good seasoned and kilned lumber at a price much cheaper than if they devoted large space and capital to it. Any good piano maker ought to be a competent judge of lumber, and buy accordingly. One thing is admitted by all, and this has reference to a well-known fact in all mechanical constructions. A manufacturer may build two machines just alike in every respect, of the same materials, by the same workmen, on the same plans, with the same care, and when finished one will be better than the other. No cause is apparent, and none can be ascribed. This is also the case in pianos. When this occurs, and an instrument does not quite come up to the standard, a medium grade piano house will stand the instrument to one side until some competent judge and buyer comes along who will take the instrument at a trifling reduction, and it is put in use without any apparent injury to the house whose name it bears. If such an instrument comes into the wareroom of a high-priced house it is broken up and never sold. Such losses as these must be paid for by charging more for other instruments. Another difference lies in the custom of these high-priced piano houses to cast their own iron frames and making their own action, so that they can say that everything about their pianos is their own make. As has been already shown, this is more expensive. While it is a fact that the actions made by good action makers for first-class pianos are in material and workmanship just as good as those made in the shops of the high-priced piano makers, they are looked upon by them as ready-made and inferior. If a buyer is willing to pay for this extra cost, he is at least sure of the quality of the work he gets. Another consideration entitles these high-priced piano makers to charge the higher prices. They must needs occupy larger premises in more prominent localities, costing more rent; they must employ high-priced salesmen, and their office and wareroom accounts are very much higher. All this and many minor items must be paid for by the purchaser along with the "name."

Incidentally with this information which has been used in this article a great many interesting facts were elicited. A piano maker to-day is an entirely different workman from what he was fifty years ago. At that time everything that was used in a piano was made in the shop, from ripping out the lumber for the boards to spinning the covered strings. Even the lead in the keys was then cast in the piano shop. Piano makers made their own sounding boards, the patterns for their plates, and when received from the foundry drilled the holes and pinned them. Then they used to saw out their own veneering, only mahogany being used; also their ivory keys from the tusks, and bleached them. All this has changed, machinery has been introduced, and the trade has been subdivided into branches in which the workmen become adepts; but the old race of men who could, as they used to say, cut down a tree and make it into a piano, are rapidly dying out.

Many popular errors exist about pianos. One especially, that we have no more ivory to make the keys, is false. Just as good ivory comes here now as ever, but unfortunately only the best piano manufacturers buy this grade.

A piano properly used should last many years, the action generally gives out first. Old pianos may be seen where the ivory of the keys has been worn down to the wood by the friction of the fingers. The leather, felt and soft fabrics wear first—the wood seldom wears. A string breaking while the piano is being tuned is not an evidence of inferiority; the best strings may break—as the slipping of a pin will do it. American felt is being made, and the manufacture has been so improved as to make it almost equal in quality to that imported from Germany; yet it is not quite as soft a fabric as the latter, and therefore has not yet come into general use.

While the outside appearance of a piano case ought to be easily judged by any one who has examined polished and varnished wood, the inside of a piano requires an experienced eye, because, though to the ordinary observer the necessary regularity of arrangement of the hammers and strikers conveys an idea of beauty and workmanship, it may be poor workmanship and defective. There is also a great differerence in the taste of piano purchasers, some preferring a brilliant tone, while others demand a soft tone. Both these extremes have been tried by manufacturers, but all have eventually found that a medium tone is the most generally acceptable.

(*To be continued.*)

RAISIN CULTURE.

VIVID DESCRIPTION OF A CALIFORNIA VINEYARD.

The California raisin industry is one of the most profitable, promising and rapidly-extending specialties. Not only so, but the raisin is winning wide reputation for our State in distant parts, and our raisin districts, especially in the San Joaquin Valley, are enjoying a good share of the influx of population. A single branch of production which made an out-turn last year of one and a quarter million twenty-pound boxes, or, in round numbers, 25,000,000 pounds of dried fruit, and which bids fair to increase this year, possibly 33 per cent., is naturally attracting much attention. This interest is also stimulated, no doubt, by the fact that in spite of this production and the foreign product as well, there is this year a great shortage in the world's supply of raisins. The outlook is that those who have been planting raisins so resolutely and confidently during the last few years will find themselves luxuriating in generous returns this year, if no unfavorable influence prevents the realization of present crop promise. In winter are seen the vines in their regular rows correctly aligned from any point of view. The foliage has fallen, the canes have been pruned back to a few buds, and nothing appears to the casual observer but gnarly stumps with crests of pronged spurs, the old bark black, ragged and uninviting, the ground covered with rubbish of dead leaves and brush and clods. Such is the aspect of a vineyard until the winter rains start the growth of verdure along the rows. Then follow the plowing and harrowing, or cultivating, and the sorry vine stumps are surrounded by an even surface of well pulverized soil. Soon the vine feels the warmth of the spring sunshine, the foliage starts, the gnarly, spurred head of the vine is hidden beneath a tuft of crisp, delicate leaves; then, if frosts forbear, out shoot the canes with twining tendrils, the vine stump is lost to sight, the field becomes an expanse of beautiful green mounds. Back and forth go the cultivators, each time the pathway of brown soil becoming narrower, until at last vine links tendrils with vine, and the field is a sea of green. Vine stump, brown soil, everything is concealed beneath the dense mantle of verdure. Such is the California vineyard at midsummer. In young vineyards there will be protruding stakes and bare patches of soil, but in the old vineyards there is neither sign of stake nor trellis. The vine pruned to support its own weight, except such as it can distribute over the surrounding soil, needs no support. There is nothing handsomer in the midsummer landscape than the green of the vineyard contrasting with the browns and yellows of the grain fields or the unimproved hillsides. Orchards are green as well, but the vine has a density of foliage and a uniform verdure which can be selected as far as the eye can perceive. As the summer shades into autumn the scenes in the vineyard change. The heavy clusters of ripe grapes are gathered, spread upon wooden trays and exposed to the clear sunshine and warm, dry night air of the interior valleys of California. As the available space between the vines does not always accommodate the fruit, all surrounding spaces are employed. The avenues around the vines are spread with trays, and the banks of the irrigation ditch are also covered.—*Min. and Sci. Press.*

A MELODIOUS DISPUTE.

A PIANO-FORTE MAKER'S VIEW OF JOURNALISM.

(From the *Musical Courier*, June 4.)

In our last issue we called attention to the bid being made by an esteemed contemporary, the AMERICAN ANALYST, for the patronage of the music trades, on the plea that they wished to instruct their readers as to what good pianos consist in, how to judge them, etc. What most interested us in their article was the declaration that they intended to work with the *Musical Courier* in exposing the stencil fraud. We called attention to their first effort in the line of piano trade literature with fear that they were not sufficiently well informed to treat the matter as it should be treated, and we offered to them any information in our possession that would aid them in their good work of getting advertisements from piano houses and "going for" the stencilers. Among other things we said:

The files of the *Musical Courier* are always open to the editors of the AMERICAN ANALYST, and to any other reputable paper, and we would suggest that for the sake of accuracy and truth they might avail themselves of them before continuing their series. We should particularly advise this before they venture to touch upon the matter of stencil frauds. We shall be glad to aid them in any way in pushing on that good work, and the *Musical Courier* is the only paper in its class that has ever conducted a campaign against this evil. If, in the series promised us, the writer tells us "what a well-made piano should be," and gives us "some hints as to the great difference in prices," and tells us "how to buy a piano" with no more definite knowledge of his subjects than is displayed in the opening number, we feel that they will have but little practical value, and indeed may do much harm.

As an evidence of the correctness of our position we append hereto a letter addressed to us by Messrs. C. C. Briggs & Co., of Boston, one of the cleverest advertising concerns in the trade. Be it understood that we wish the AMERICAN ANALYST all the piano advertising patronage it can handle, but we are forced to suggest to them again that they are not going about it in the right way.

Here are the Briggs letters:

BOSTON, Mass., May 28, 1890.

Mr. M. A. Blumenberg, N. Y. City:

DEAR SIR—The reason we asked you about the "University" piano business was that we had received a paper called the AMERICAN ANALYST, and with it a letter from the publishing company asking for an advertisement. The company claimed to be publishing this paper for the benefit of the public, to enlighten them in the facts of bogus household materials, among them being the piano. They claimed to be "dead on to" the stencil business, and were going to show it up in big style. We, in looking over the paper, found an advertisement of the University Piano Company, and we replied to their remarks with the following letter, which is a copy of the one we sent them.

Respectfully, C. C. BRIGGS & Co.

BOSTON, Mass., May 28, 1890.

The Analyst Publishing Co., N. Y. City:

GENTLEMEN—Your favor at hand. Though we do not need any extra advertising at present, we beg to be allowed to comment on your statement that you intend to "instruct the public in what a good piano consists and expose the stenciled fraud." We should like to know how you can do this without prejudice, if you carry the announcement of a stencil piano house in your advertising columns, and, if you do not know the fact, are you sufficiently posted in the trade to instruct the public in regard to a first-class piano?

Respectfully yours, C. C. BRIGGS & Co.

COTTON STALK BAGGING.

A NEW INDUSTRY LIKELY TO ARISE FROM COTTON STALK FIBRE.

The result of the formation of the jute bagging trust has been to array against it the powerful Farmers' Alliance, now numbering, it is claimed, over two million members in the South and West. When the trust was first formed, the price for bagging was advanced from seven to twelve and fourteen cents a yard, though the price since then has fallen very much from the latter figures. The Southern planters requiring bagging for their cotton made up their minds on no account to make any purchases from the jute bagging trust, and some of them, in order to keep this vow, have used other bagging which entailed a net loss of a dollar on every bale sent to market. The high price of jute bagging, as well as the bitter war between the planters and the trust, have greatly stimulated the production of substitutes. Pine needles, bear grass, palmetto, and Spanish bayonet fibres have all been employed, but the product has been far from satisfactory. The bagging made from pine needles has been more extensively used, perhaps, than any other, but it is apt to stain the cotton, and it tears easily. Cotton sheeting is used, but this also is not strong enough, and the insurance companies object to it as not offering sufficient protection to the cotton in case of fire. As a further indication of the desperate shifts to which planters have resorted rather than use jute bagging, it may be said that cotton has been received into New York baled with willow sticks and iron hoops, so that it was necessary to open the bales with an ax. Reliable advices from Augusta, Ga., recently received, seem to indicate that the want of a satisfactory substitute for jute bagging has been met by producing a fibre from cotton stalks. Mr. William E. Jackson, a lawyer of Augusta, has given a good deal of time and attention to developing the process. He commenced experimenting with a machine patented to produce certain South American fibres by running cotton stalks through it and then submitted the fibre to a carding machine, and the result was an article which closely resembles what is known as jute butt yanks. Mr. Jackson then sent a bale of this material to a bagging factory at Paterson, N. J., and proceeded thither himself, and the bagging which was produced under his direction has been declared to be an excellent article. A detailed description of the process by which the fibre has been obtained cannot be given at this time, but it is known that the bark is removed from the stalks by means of a breaker. It is said, however, that the bark can also be stripped off by hand, or the stalks may go through the machine in their natural state, and the rollers will do the work just as thoroughly. The main feature of the fibre-producing machine consists in the forward and backward movement of the rollers, which action separates the fibre while the water underneath washes out the glue. The advocates of the new process claim that they can pay $2 a ton for cotton stalks delivered at railway stations, and make from them a bagging which can be sold at 7½ cents a yard, a price at which they claim jute bagging cannot be manufactured at a profit. The article produced from cotton fibre weighs about two and a quarter pounds to the yard, and the average requirement for a bale is seven yards. A cotton exporter recently stated that the bagging made from cotton stalks which he had examined resembled jute so closely that even a person who was accustomed to handling cotton would not readily detect the difference. It will not stain the cotton, and will show marks easily. It is said that the annual yield of stalks will produce bagging sufficient to bale three yearly crops of cotton. Should the new fibre stand the test of general use, it is easy to see that a new and extensive industry has been opened up. Cotton stalks have heretofore been considered a nuisance by planters, but if they can be made into a bagging for the baling of cotton, a great step in advance will be made. No one dreamed a few years ago that oil as well as other valuable products could be produced in paying quantities from cotton seed, but this utilization of the seed forms one of the most striking as well as one of the most important of recent advances in manufacturing. The public will doubtless watch with much interest, to see if still another new and important product is to be developed from the already fruitful cotton plant.—*Scientific American.*

SIGNING BY ELECTRICITY.—One of the marvels of electricity, and one of the most striking of the Edison exhibits at the Paris exposition, was the little instrument which enables the operator to sign a check 100 miles distant. The writing to be transmitted is impressed on soft paper with an ordinary stylus. This is mounted on a cylinder, which, as it revolves, "makes and breaks" the electric current by means of the varying indentations on the paper. At the receiving end of the wire a similar cylinder, moving in accurate synchronism with the other, receives the current on a chemically prepared paper, on which it transcribes the signatures in black letters on a white ground.

MIGHTY STRUCTURES.

SOME OF THE DARING ENGINEERING DESIGNS OF THE PRESENT DAY.

By what name the present age is likely to be known to our remote posterity, it would be rash to predict, so enormous is the development in various departments of art and industry; but, in comparison with preceding ages, it might, from our immediate point of view, be well designated as the "Engineering Age." Certainly the recent and the prospective achievements in this line throw far into the shade the most famous exploits of engineering in the past, even if we go no farther back than the middle of the present century. The Eiffel Tower doubled at one bound, as it were, the loftiest structures that man had reared; and most of them—like the Egyptian pyramids and the Strasburg spire—belonged to a period several centuries or many centuries distant, "in the dark backward and abysm of time." And now we are told that Eiffel and Edison propose to build a tower 1,500 feet high for the coming World's Fair at Chicago! The great bridges of our day are even more conspicuous illustrations of the audacity of modern engineers. The Brooklyn bridge, with its clear span of 1,595½ feet, was an amazing feat; and the Forth bridge, with its two cantilever spans of 1,700 feet each, now just completed, is, in some respects, far more stupendous. But the appetite for triumphs like these appears to grow with what it feeds upon, and the engineer seeks new and greater worlds to conquer. Plans have just been made for a railroad bridge across the Hudson at New York with a span of 2,850 feet, or *more than half a mile*; and it is quite probable that it will be built. Its extreme length, including anchorages, will be 6,500 feet, that of the Brooklyn bridge being 3,700; and the height of the towers supporting the cables is to be 500 feet, the Brooklyn ones being 272. The dimensions of some portions and the amount of material required will be immensely greater. The cables, for instance, will be 48 inches in diameter instead of 15½, and the weight of iron and steel in the structure will be 60,000 tons instead of 6,750. The cost, exclusive of land damages, is estimated at sixteen millions of dollars, and the time required for construction at ten years. What bigger and bolder enterprises in bridge-making may be planned by the time this one is finished, who will venture to guess? It would seem that the possible limits of *span* are nearly reached here, and that the great bridges of the twentieth century can only be longer and costlier works of the same general character. Yet who knows.—*Pop. Science News.*

PHOTOGRAPHING COLORS.

AN IMPORTANT DISCOVERY IN PHOTOGRAPHIC SCIENCE.

Franz Veress, of Klausenburg, Transylvania, has exhibited in Vienna, at the Photographic Institute, some specimens of photography in colors. The photos are upon glass and upon paper. The former are diapositives, and if looked through show, for the most part, a beautiful ruby-red ground color, with a picture in bright, sometimes brilliant, colors, from the deepest hue of ruby-red—far deeper than the ground color—to light orange, with several shades of red and yellow, and from violet to aniline blue, and the intensest, most brilliant blue that can be imagined. The same colors prevail also on the paper-positives, which have all a grayish-brown ground color, upon which the red inclines more to purple than ruby, and the violet is especially brilliant. Green is missing on all positives, and it is not known whether Herr Veress has succeeded in producing it, since the photos now in Vienna were obtained some four weeks ago. In looking at the photos through a magnifying glass, it is impossible to detect a single impurity in the drawing or in the pigment of the colors. The outlines of the pictures are perfectly exact, and each color stands out from the other with marvellous distinctness. The colors were quite unaffected, and not changed in the slightest degree, after being exposed to the ordinary daylight for fully three weeks, during which the photos upon glass and paper were examined by a great number of persons, were lying about uncovered at different times of the day, and were also shown during a lecture at the "Society for the Propagation of Natural Science" during gas light. Such permanency of color on photos has never been known before, and constitutes the principal achievement of the Transylvanian discoverer. It will be necessary to expose the photos to a more severe light-experiment before final judgment can be passed; but if we remember that in former cases of photographing in natural colors a coating of varnish has had to be applied to protect the colors, as otherwise they would have faded away within a few days, if not within a few hours, it must be admitted that the solution of the problem has been greatly advanced by Herr Veress, when he has succeeded in making the natural colors durable for such a long time in diffused light. In sending the photos Herr von Gothard gave the following details of the applied process. The sensitive preparation is a silver chloride emulsion in collodion or in gelatine, and the solution, being prepared in a peculiar way, which is the inventor's secret, is poured upon either the glass or the paper, where it soon takes a brownish-red color. The plate is put into a copying frame and exposed to the rays from a transparent colored drawing, of which the negative picture is soon visible, the dark parts appearing, of course, in white. The exposure has to last in the case of glass negatives two or three hours, and in case of paper at least three days, as the colors come out very slowly; but the picture having been fixed in an alkaline bath the colors become brighter and more intense. The process in the camera would require an exposure lasting several weeks, but even the ordinary process will be largely reduced if some experiments on which Herr Veress is at present engaged succeed as well as he hopes, and according to the latest information he has already so changed his original system as greatly to lessen the time of exposure, especially for the paper negtives.

FOOD INSURANCE.

A NOVEL SCHEME OF CO-OPERATION PROPOSED IN BOSTON.

The Boston *Herald* describes a form of practical insurance against want which it says is under advisement in that city, in which a large portion of the laboring people should be deeply interested. A workingman is often thrown out of employment and reduced to great distress because he has little or no money laid by, and is unable to provide for his board and lodging while out of employment. It has been suggested that a people's mercantile company might be formed among themselves which would undertake to provide board and lodging with landlords at the rate of $4, $5, or $6 a week, on such terms that, after one month of regular payments, one week's board at half-pay might be placed to the credit of the interested party, so that if he were out of work, or sick, or otherwise disabled, he might not be brought to discomfort because he could not pay his board. At this rate in six months a man would be entitled to one and a half months' credit for board, and in one year to three months' credit for board, which, at half rates, would only cost him the price of one and a half months' board anywhere. This plan, if it can be carried out, would be a great relief to hundreds of working people who are suddenly disabled or compelled to be idle. It would be impossible for anybody to fall rapidly in debt to such a company, and only in cases of extreme misfortune would persons be willing to surrender their certain insurance of food and lodging, which would grow larger as the years rolled by. A company of this kind would need to have a responsible backing in order to secure public confidence, but though it has never been attempted, it could easily be conducted on the basis which is common to similar undertakings. Payments would be made to landlords the same as now, and the company, after collecting a twenty per cent. discount every week for a month, could afford to give one week's credit, and do business on that basis. The credits would not be transferable except by consent of the company of directors, and would be dealt with by them in the same manner as if they were a life insurance policy. When such a company was established its range of restaurants or lodging and boarding houses would be such as to meet the wants of all classes of people. This is a system of co-operative effort, but it would be a company that could accumulate capital and increase its resources in proportion to its membership. It would thus be a safe investment for individuals, without involving them in any personal responsibility beyond what their regular payments would demand. This organization is not yet in existence, but it is one of the first practical suggestions for self-help which has sprung out of the movement for Christian socialism in Boston, and when it is properly developed and brought into shape, it looks as if it might meet a present and pressing need among people who are not forehanded and are not accustomed to making investments for themselves.

BOOK HYGIENE.

WHAT CAUSES THE ODOR OF MUSTY VOLUMES.

The assistants in the British Museum say that visitors to that institution frequently have a hard time getting "acclimated" to the place. An hour spent in the rooms invariably gives the visitor (for the first time) a headache. Sometimes it is only after repeated visits that one is able to indulge his researches without carrying away a headache with him. Women seem particularly sensitive to this curious malady, which is said to arise from the peculiar odor created by the storage of so many books. You can get some idea of what this odor is by going to your bookcase, that has been closed for twenty-four hours, and opening one of the doors; immediately your olfactories will be greeted by the mustiest fragrance imaginable. Bibliomaniacs profess to love this odor, and many declare that they cannot value a book unless it has about it that unmistakable and ineradicable smell which infects a volume when once it has crossed the sea in the hold of a vessel. William Blades, on the other hand, says that the musty smell betokens the decay of a book, and he cries out against all bookcases which are tightly closed. It is his theory that books require pure, dry air constantly, and the result of his experiments and experience seems to be that the most healthful kind of bookcase is one that has lattice doors, behind which may be hung thin curtains to keep out the dust.

AUTUMNAL GLORIES.

WHY THE LEAVES CHANGE COLOR IN THE FALL.

"Probably not one person in a thousand knows why leaves change their color in the fall," remarked an eminent botanist the other day. "The common and old-fashioned idea is that all this red and golden glory we see is caused by frosts. A true and scientific explanation of the causes of the coloring of leaves would necessitate a long and intricate discussion. Stated briefly and in proper languarge, the causes are these: The green matter in the tissue of a leaf is composed of two colors, red and blue. When the sap ceases to flow in the autumn, and the natural growth of the tree ceases, oxidation of the tissues takes place. Under certain conditions the green of the leaf changes to red; under

different conditions it takes on a yellow or brown tint. The difference in color is due to the difference in combination of the original constituents of the green tissue and to the varying conditions of climate, exposure and soil. A dry, cold climate produces more brilliant foliage than one that is damp and warm. This is the reason that American autumns are so much more gorgeous than those of Scotland and England. There are several things about leaves that even science cannot explain. For instance, why one of two trees growing side by side, of the same age and having the same exposure, should take on a brilliant red in the fall, and the other should turn yellow; or why one branch of a tree should be highly colored and the rest of the tree have only a yellow tint, are questions that are as impossible to answer as why one member of a family should be perfectly healthy and another sickly. Maples and oaks have brightest colors."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

June.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb.

FRUITS.—Cherries, strawberries, bananas, pineapple.

PRACTICAL RECIPES.

VEAL PIE.—Stew one and a half pounds of lean veal till almost tender, add to it six or seven small tender carrots scraped and cut in pieces, two or three potatoes cut in pieces, and two small onions quartered. Let cook until the vegetables are well done, season, and take from fire. Fill a baking dish with the stew, and bake with upper crust only. If the gravy is too thin it may be thickened with a little browned flour rolled in a bit of butter.

STRAWBERRIES AND CUSTARD.—Strawberries are very nice served with a soft custard made as follows: Put one pint of sweet milk, boil over the fire in a farina kettle. Beat thoroughly two eggs, yolks and whites together, add to them three tablespoonfuls of sugar, a teaspoonful of vanilla, and a pinch of salt; beat well and just before the milk comes to the boiling add this mixture slowly to it, stirring all the time. Now let it boil for a few moments to thicken, then take from the fire, and when cold add to it one-half pint of whipped cream. Let this keep quite cold until time to serve.

ANGEL'S FOOD.—One cupful of flour sifted nine times, one and a half cupfuls of granulated sugar, whites of twelve eggs beaten light, one teaspoonful of cream-tartar, one teaspoonful of vanilla, stir the sugar into the egg, then the flour. Do not grease the pan. Bake forty minutes, when done turn the pan upside down until cold.

BAKED EGGS.—Beat up six eggs, add one tablespoonful of flour, six tablespoonfuls of milk, melt a lump of butter in frying pan, when hot turn the whole in and bake in hot oven.

STRAWBERRY SHORTCAKE.—Make a cup cake, one cupful of butter, two cupfuls of sugar, three cupfuls of flour, four eggs, two teaspoonfuls of baking powder, one cupful of milk, vanilla flavoring; beat it well so that it may be good and fine. Bake in jelly cake tins, and when done add the berries, giving each layer a plentiful sprinkle of powdered sugar. Whip half a pint of cream to a good stiff froth, and pile it on top of the cake when ready to serve.

ASPARAGUS SOUP.—Cut the tops off a bunch of asparagus, and cut the rest of the stalks up in small pieces. Put a small onion into a sauce pan with a little butter and fry it, add to it the asparagus stalks and two cupfuls of veal or other white stock. Cook till the asparagus is very tender then mash it through the flour sieve. Add two cupfuls of boiling milk, and thicken with two tablespoonfuls of flour rubbed into two tablespoonfuls of butter. Now put in the asparagus tops and when they are done, add if you wish one cupful of hot cream, and serve.

LOBSTER PIE.—Remove the meat from the shell, cut it into small pieces, season highly with pepper, salt, cayenne, a tablespoonful of vinegar, three tablespoonfuls of finely chopped picallilli, and three whole cloves. Put this in a deep pie dish, cover with mashed potatoes, and brown in a hot oven.

TUBERCLE AND SCROFULA.

Tubercle and scrofula are among the commonest and most fatal diseases of mankind. While the mortality from this disease is very great in some European countries, amounting to one-seventh of the death-rate, and that, too, among the youth and flower of the people, there is everywhere evidence that a very much larger proportion had incurred a slight degree of the malady and had survived it. Nothing is more common in the course of post-mortem examinations than to find traces of "obsolete tubercle" in the lungs and lymphatic glands. No disease runs more in families than tubercle. While there are all these evidences of a wide-spread constitutional liability to tubercle, it is at the same time clear that the victims of the hereditary taint are only here and there—perhaps one out of a large family, or one member of a family in childhood and another in the second half of life, according as they had been exposed to sufficient exciting causes. In the most extreme cases of heredity, which are not so rare but that one or more are familiar to every circle, the members of a family fall into consumption, one after another, as they grow up, as by an inevitable fate. The relation of scrofula to tubercle is a subject of much intricacy. The familiar instances of scrofula are the enlarged clusters of lymphatic glands of the neck in boys and girls, who are either of the fair and delicate type or of the dark and coarse type. Another large class of the scrofulous cases are subject to white swellings or other chronic diseases of joints, usually the knee, hip or elbow. But many slighter conditions, such as eczema of the head and face in children, are set down to scrofula. Again, serious visceral disease leading to a fatal result, especially in the kidneys, testes, ovaries, and bladder, is for some reason reckoned scrofulous rather than tubercular. But this latter class of cases is certainly tubercular, as much as anything can be said to be tubercular. A great part of all that is reckoned scrofulous may be said to be inherited tubercle, affecting the lymphatic glands of the neck most conspicuously, running a very chronic course, often disappearing at puberty, and associated with a delicate skin, fair hair, large eyes, and other features of a well-known type. Whether as an inherited disease or as an acquired, scrofula can be separated from tubercle by no very definite line. Tubercle, as the name implies, is a small tuber or round nodule, the nodules are often "military" or the size of mil'et seed. For the variety of diffuse or "infiltrated" tubercle, which is often found in the lungs, it has been made a question whether it should be reckoned as tubercle at all, by reason of its wanting from first to last the character of distinct, small nodules. Tubercles are sometimes large, especially the tubercles of the genito-urinary organs and of the brain; and these are generally made up of a number of smaller nodules fused together, and surrounded by a common capsule. The larger tubercular masses or conglomerates of tubercules are those that have been claimed as in a peculiar sense scrofulous. The fusion of numerous small tubercular centres into one large area can often be seen in lymphatic glands in all its stages under the microscope. The prevalent modern opinion is that all these various manifestations are due to the infective action of a virus, just as in syphilis; and, as the effects of the syphilitic virus includes not only gummatous nodules but also "inflammations" of the skin, mucous membranes, periosteum, and other textures, so the effects of the tubercular virus include not only "tubercles" properly so called, but also a variety of diffuse "inflammatory" conditions. The most common seat of the tuberculous process is the lungs, so that tubercle and phthisis pulmonalis have almost come to be synonymous. In a certain proportion of cases the tubercles and the tuberculous "infiltrations" are found in the lungs only, but in many cases the pulmonary tuberculosis is only a part of a general infection, which includes the serious membranes and lymphatic glands, the intestines, the liver, the spleen, the kidneys, the brain membranes, the choroid coat of the eye, the bones, and the joints. Cases have been described, also, of tuberculous ulcers of the tongue and stomach, and of tubercles in and around the thoracic duct. On the assumption that tubercle is due to an introduced virus, it has been attempted to classify the cases according to the probable way of ingress of the virus; those with the pulmonary condition most prominent would have received the infection with the breath, while another class, including the numerous cases where military tubercles are found in the liver when carefully looked for with the microscope, would have absorbed the virus along with the food from one part or another of the digestive mucous membrane. The tuberculous kidney (with ureters and bladder), again, would be explained on the hypothesis of that organ attempting to eliminate the virus from the system; but even among the pulmonary cases there are some in which the tubercles had arisen from infection brought by the venous blood, just as in the dissemination of sarcomatous tumors; it has been shown by the very elaborate dissections of Weigert, that tubercles may grow into the walls of veins, the tuberculous substance so getting carried into the blood current, wherein the first resting place would be the pulmonary capillaries, except when the vein was tributary to the portal system. Enough has been said to show that the common sense method of treating these cases is to cleanse the system. This can best be done by the use of Dr. J. C. Ayer's Sarsaparilla, the standard preparation which has been so long and favorably known, and beneficially employed by thousands.

BUSINESS NOTES.

GOOD WHISKEY AND BAD.

A gentleman drinks a glass of whiskey and the palate or stomach revolts instanter; and another brand is tried and the entire system receives the draught with satisfaction and delight. What makes the difference? While the time-honored Texan who said, "Stranger, there are no bad whiskies; all are good, but some are better than the rest," may have represented a large element in the community, he did not express the thought of the great majority, and much less of those who are conversant with the ways of the average distiller. Whiskies are not one and the same thing. Some are raw, irritating and unwholesome; others are mild, delicious, and in every way conducive to health. It is the same with apples. A green one plucked from the boughs or gathered from some forceful windfall is

deleterious in every respect. The child who eats it is stricken with cholera morbus and the adult with gastritis. The powerful oils and chemical compounds which are evolved in the growth of the fruit and which are not destroyed until maturity, when the sunshine, soil and fresh air convert them into healthful compounds act as mere drugs or even poisons, and excite the digestive system to such an extent, that Nature in her desire to expel a dangerous intruder, calls upon disease, so-called, to aid her in her attempts to dislodge the new-comer. Whiskey in this regard differs in no wise from apples. When raw or green it acts as a drug or poison. The amylic spirit and compound ethers and alcohols it contains act as powerful carthartics or drastics, and so occasion pain, sickness and sometimes even graver injury to the physical organization. As it ages and ripens these elements undergo a change into agreeable bodies which chemically is exactly the same as the change in unripe fruit from the irritating and poisonous ingredients into the delicious nutriment and exquisite flavor of the ripe article. This is the reason why every expert prefers an old to a new whiskey, and why the mild, rich brands are superior to the harsh fusel-containing grades so common in the market of to-day. There are but few whiskies at the present time which represent in the best way this ripening process. Among those that stand in the front rank is the Y. P. M. (Young's Pure Malt) made in Philadelphia. It probably is made in a similar yet somewhat different manner from nearly all its rivals, but unlike these it does not pass into the hands of the consumer until it is so thoroughly ripened and refined that all its raw elements have been converted into aromatic, health-giving, delightful bodies. For this reason it appeals not only to those who are blessed with perfect health, but also and ever with greater force to those suffering from asthma, bronchitis, consumption and other wasting complaints. In all of these disorders it increases both appetite and digestion without irritating the stomach or the great vital functions of the body. We know from long experience that it does not raise the patient's temperature. It prevents the running down of the system in the late hours of the night, when asthmatic, bronchial and other attacks assume their worst form. And above all it serves as a food, heat-generating, energy-creating and nerve-restoring, better than the finest medicines in the world. It is on this account that the Y. P. M. has become a standard article in such great magazines as Park & Tilford's, Acker, Merrall & Condit's, in New York, and similar establishments all over the United States. Its success and popularity are based upon mere merit, and the recommendations consequent on favorable results obtained by the medical profession, and upon neither meretricious displays in daily journals, nor upon the reckless expenditure of money, not to say open bribery of barkeepers, practiced by the manufacturers of much inferior goods.

VILLACABRAS WATER.

Villacabras water is the best natural mineral purgative water known, possessing over all others the following advantages: 1st.—It has neither repulsive smell nor bitter taste. 2d.—Only a small quantity is required to produce its effects. 3rd.—It causes no Gripes nor Pains whatever. 4th.—It produces no Constipation nor any other ill after-effects. 5th.—It can be taken either pure or mixed, in equal parts, with milk. 6th.—It acts as a Laxative or Purgative, according to the dose taken. 7th —Its efficacy will not be impared should the bottles remain uncorked.

HORSFORD'S ACID PHOSPHATE.

Ill effects of tobacco relieved by its use. Dr. O. C. Stout, Syracuse, N. Y., says: "I gave it to one patient who was unable to transact the most ordinary business, because his brain was 'tired and confused' upon the least mental exertion. Immediate benefit, and ultimate recovery followed."

UNMANLY FIGHTING.

Keasbey & Mattison, a pharamaceutical manufacturing firm, of Philadelphia, have had considerable and somewhat bitter experience in the courts, and have consequently been like the school boy after having received a severe castigation, very quiet. Lately, however, they have started a crusade somewhat on the Don Quixote plan of inducing Sancho Panza to receive the flagellation. Keasbey & Mattison have conceived the idea that they ought to have the world, or rather that they should be allowed exclusively to receive all the benefits of the popularity of the Bromo compounds. Not daring to attack their larger and stronger competitors, they have commenced legal proceedings against one of the weakest men in the trade; a man who has just emerged from a criminal prosecution for imitating another man's trade-mark. The purpose, evidently, is to obtain an injunction against this man, or perhaps they have made an arrangement with him for a sort of friendly suit, and then to use that as a precedent for proceeding against the larger houses. In this they will be disappointed. If such houses as William R. Warner & Co., of Philadelphia, against whom they must ultimately aim, do not defeat them by coming to the assistance of the small weak man they are now attacking, they will certainly make a vigorous, and we doubt not successful defense, against any attack made upon them. The Warners have justice and facts on their side in this controversy, and are not the kind of men to give up their hard-earned property on every bold attempt made to dispossess them of it. The fight will be bitter but interesting.

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CONTENTS.

ONLY A NAME.

Scientists and laymen alike, before and since the time of Franklin, have been unable to explain in any satisfactory manner what electricity is, and in the light of current discussion it would seem that the phenomenon in question is more likely to be defined negatively by an explanation of what it is not. Professor Dolbear, of Tufts College, commenting on a recent book entitled, "Modern Views of Electricity," calls attention to the suggestive statement made by Professor Lodge, its author, that after all the inquiries which have been made as to what is electricity, the answer may have to be, There is no such thing. The words "electric" and "electrification" may be retained, but the word "electricity" may have to go, simply because it does not stand for a reality. It may be difficult for one who looks at the phenomena, rather than to the relations involved in the phenomena, to imagine that electricity is not some sort of an entity, and may be described, if one knew how, as one would describe any other something. It would certainly be curious if it should turn out that the reason no answer has been forthcoming to the question, What is electricity? is that there is no such thing, and the question is an improper one; as if one should ask, What is odor, or brightness, or zero? Professor Dolbear goes on to show that the history of the physical sciences shows a number of parallel cases. Thus, about a hundred years ago the phenomena of heat were attributed to phlogiston or to caloric—each supposed to be an entity of some sort. The latter term is still retained for convenience, but it has ceased to have any significance as a something that gives origin to heat phenomena. When it was discovered that such phenomena were due to atomic and molecular vibrations, or what is now often called a "mode of motion," both the above words ceased to have any meaning; in other words, there was no such thing as phlogiston or caloric. Again, light was once thought to be an entity; now we know that light is a sensation, and properly does not exist independent of the eye. What was treated as light is now called "radiant energy" or "ether waves." Though the term "light" is retained, it has lost the significance it had when it was supposed to be a created something. In similar manner, physiologists for a long time explained the phenomena exhibited by living things, both vegetable and animal, as due to "vital force"—something supposed to be utterly unlike, and not necessarily related to, the other forces in nature—a force that could control the other in a living organization. Now that has been altogether abandoned. No biologist of any repute now believes in "vital force;" and the question, What is life? which has always baffled every one in his attempt to define it, now turns out to be an improper question, as it is reducible to complicated molecular motions and not to an entity. It really seems as if all along the line of knowledge of the physical universe what have been called "forces" as peculiar somethings, having individuality, as matter has, have no existence at all; that matter and ether and motions of one sort or another are all the factors in phenomena.

A LITTLE OUT OF TUNE.

A marked copy of the *Musical Courier* of June 18, has been received at this office containing a brief editorial reference to the AMERICAN ANALYST, the gross inaccuracies and misstatements of which would be amusing if they were not so palpably prompted by a mingled spirit of jealousy and mischievous malice. Our valued contemporary appears to have lost its judgment and its temper together at our exposure of its inconsistency in professedly denouncing the piano "stencil" schemers, while it was at the same time actually advertising the goods and, presumably, advocating the cause of several leading concerns of that kind in its own columns. It is true that that course on its part cannot do much harm to anyone, as nobody sees the *Courier* excepting the piano-forte dealers, whose function it is to respond to and not to create the demand for those instruments. The question rests wholly between its manager and his conscience. The *Courier's* animadversions on the AMERICAN ANALYST are similar indications of inconsistency, as it refuses to continue the republication of our series of piano-forte articles, and thereby wantonly deprives its readers of the valuable information, with which it might have illuminated its pages. In that respect, we think our esteemed contemporary has made a serious mistake, for which we offer our condolences to its patrons of the piano trade, who certainly are serious losers thereby. As to its comments on the AMERICAN ANALYST we are content to pass them without response, as it has been our course always to avoid the delusive snare of newspaper controversy, which never benefits the contestants and always disgusts their constituents. We might protest against the *Courier's* interjection of a gratuitous and untruthful attack upon one of the oldest and most respected piano manufacturing firms in this country, but that added phase of the controversy does not relate to us, and the firm in question is amply able to answer for itself and in its own manner.

TEN YEARS OF NEW YORK.

The eleventh census was completed so far as the enumeration of the residents of New York was concerned in just two weeks, the papers, with trifling exceptions, having been forwarded to the superintendant in Washington on June 14. Some of the results that have already been published relating to the population of the metropolis are of interest, in the view they give of the city's present magnitude, as well as on account of the evidence they bear of its rapid growth. These points are best shown by comparing the figures of this census with those of the preceding one. By the census of 1880, the population of the city of New York at that time was 1,206,299. This year's census is expected to show a population of 1,675,300. There has been no increase of geographical boundaries during the intervening ten years. The death rate in New York per 1,000 inhabitants has declined during the past ten years from 26.2 to 24. On an average 35 more boys than girls are born in New York every week. On the average 55 more males than females die in New York every week. By force of natural increase, therefore, the female population grows more rapidly than the male. During the past ten years, from this cause alone, the female population of the city has increased 10,000 more than the male population. Speaking of the female population only, there are fewer blondes, more brunettes, and just as many auburn-haired girls and women as there were ten years ago. As the climate gets milder, the number of dark-haired persons increases, and the change has been more marked by the fact that most of the immigration of New York City has, of late years, been from the southern countries of Europe and from the southern

portions of the northern countries. Ten years ago the estimated value of real estate in this city was $1,000,000,000. The exact figures were $1,049,-340,336. This year's valuation of real estate in New York is $1,500,000,000 — just 50 per cent. more, and an increase at the rate of fifty million dollars a year. Ten years ago there were in New York 96,402 buildings, this year there are 114,500, an increase of 18,000. 42,000 buildings are in the territory north of Fifty-ninth street. Ten years ago the Tenth ward of this city, which lies north and south of Grand street, east of the Bowery, had an average population of 432 to the acre. In 1870 it had 377. This year it is 540. According to the census of ten years ago, the foreign born population in the city was then 478,670. This year it is computed to be 675,000. There has been during the past ten years no increase, substantially, in the number of residents of New York of Swiss, Belgian, Dutch, French, Welsh, or Scandanavian birth. Ten years ago there were 4,000 Hungarians in in New York. Now there are 20,000. Ten years ago the Italian population in this city was 12,223. This year it is 45,000. Ten years ago there were 8,000 Bohemians in the city of New York. Now there are 16,000. Four-fifths of the adult male Bohemians are either cigarmakers or cabinetmakers. Ten years ago there were 10,000 natives of Poland and Russia in New York. Now there are 50,000 Poles and Russians and their descendants. The Russians have a virtual monopoly of the cheap clothing trade of the city; the Poles are at first peddlers, then drummers and finally retail storekeepers. Ten years ago there were 163,482 natives of Germany in the city of New York. This year there are 200,000—more Germans in New York than in Bremen, Frankfort, Cologne, Stuttgart, Dusseldorf, Lübeck, Crefield, Nuremberg, Stettin, or Leipsig. Putting the probable population of the city this year at 1,675,000, there are more people in New York than in any one of the following States: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, (more than the total population of the last four combined), Kentucky, Kansas, Louisiana, Maine, Maryland, Minnesota, Mississippi, Nebraska, Nevada, New Hampshire, New Jersey, Oregon, Rhode Island, South Carolina, Vermont, West Virginia, or the four new States of North and South Dakota, Washington and Montana.

THE MODERN REED ORGAN.

ITS GENESIS, DEVELOPMENT AND STATISTICS OF MANUFACTURE.

It appears that instruments in which "free reeds" were used were made in this country quite early in the present century. Aaron Merrill Peasley in 1818 obtained a patent for reed instruments; this patent is now in the possession of the Mason & Hamlin Organ and Piano Co. J. H. Bazin, of Canton, Mass., is also named as an inventor in this connection. The instruments manufactured at this time were, of course, imperfect and defective in construction. The earliest forms of an organ with free reeds and without pipes, the bellows being worked by the foot, were the "seraphine" and the "melodeon." The latter was first introduced about 1840, and two of the best known firms engaged in its manufacture were those of Carhart & Needham, and George A. Prince & Co., both of Buffalo, N. Y. One form of this instrument, the harmonium, appears to have been invented by Debain, of Paris, and improved by Alexandre, whose name it bore in this country. Until the introduction of the perfected reed organ in 1861, the melodeon was very popular in this country, despite its faults, and, amongst others the firm of Geo. Prince & Co., which dissolved in 1875, manufactured many thousands of these instruments. Jeremiah Carhart about 1836, made several improvements, notably the plan of acting on the reeds by suction instead of blowing, which Peasley had spoken of in his patent. This is a characteristic feature of the American organ, the foreign instruments being still worked by force bellows. Carhart's partner E. P. Needham also made some improvements. But the most important improvement and the one which has contributed greatly to the present perfection of these instruments, and their consequent popularity, was the discovery that by twisting and bending the reeds in various ways the quality of tone was greatly modified and improved. This discovery was made in 1848 by Emmons Hamlin, then a workman in the factory of Prince & Co. In 1854 he and Henry Mason, a son of Lowell Mason, began the business of the firm which in 1868 took the name of the Mason & Hamlin Organ Co. Under the inventor's eye this newly-discovered art of "voicing reeds" was carried to great perfection. In 1861 the firm first introduced the American cabinet or parlor organ in its present form. The excellent instruments produced by the firm have placed it in the foremost rank of American reed organ manufactures. The factories of the firm are located at Cambridgeport, Mass, and the home office in Boston, with branch offices in other cities, and agencies all over the world. The name, in 1882, was changed to the Mason & Hamlin Piano and Organ Co. Another well-known firm is that of Jacob Estey & Co., Brattleboro, Vt. The business was begun in 1846, by two gentlemen, in a building owned by Jacob Estey. In 1852 the concern passed into the hands of Mr. Estey. The instruments of this firm are also well known in this country and abroad, and rank among the best. The firm of Wilcox & White, of Meriden, Conn., was formed in 1876. The business grew rapidly, and their organs are now favorably known the world over. Numerous other manufacturers are also engaged in this business in the United States. The many improvements which have been applied by American makers have resulted in producing an instrument which is extensively used in foreign countries as well as in the United States. These organs are made in all styles and sizes, some of them even with two or three manuals being then almost equal to small pipe organs in power and resource. The popularity which the instrument has attained through the improvements introduced is very great, and it has been estimated that there are now more than 80,000 cabinet or parlor organs under various names made and sold yearly in the United States alone, by about 250 makers. According to one table we have seen, there were exported from the United States during the last ten years 10,723 organs of the value of $681,567.

In England a similar instrument is known under the name of harmonium, and perhaps no musical instrument ever became, in a few years, so widely known and used. The reason for this may at once be found in the facilities it offers for playing easy music, and, when simply constructed, its comparatively low price, which renders the purchase of a tolerably good reed organ possible, when the cheapest pianoforte, fairly playable, would be unattainable, and the real organ, though of small size, quite out of the question. Besides being a convenient substitute for an organ, the reed organ can also be used in domestic concerted music, to play all or any of the wind band parts of the orchestra; it may even be employed as a substitute for the violin, and in such vicarious uses it is past all question one of the handiest of deputies. What we are now about to say is intended to apply chiefly to the harmonium, the original of the American reed organ. It is true, the tone of the harmonium is not in itself beautiful; the prominence in sounds from reeds of certain overtones is irreconcilable with pleasure to the ear unless by convention of habit, and the necessity of tuning according to equal temperament all major thirds too sharp leads through this harmonic peculiarity in the chords to an abnormally disagreeable quality, from which those whose nerves are very sensitive or weak are not unfrequently painfully affected. In this respect the American reed organ owes its popularity to its being less pronounced and reedy in timbre (its softer tone being nearer to that we are familiar with in the church organ), and to its being easier to play for simple domestic uses. Yet it is claimed that the harmonium has more independent character as an instrument, and is capable of higher treatment in performance than the reed organ. Both are known as "free reed" instruments, the musical tones being produced by tongues of brass, technically "vibrators," set in oblong frames; the sides of these they do not quite touch, but pass when in movement freely downwards—the "beating reeds" used in church organs covering the entire orifice. A reed or vibrator, set in periodic motion by impact of a current of air, produces a corresponding succession of air puffs, the rapidity of which determines the pitch of a musical note. There is an essential difference between the harmonium and the reed organ in the direction of this current; in the former the wind apparatus forces the current upwards, and in the latter sucks it downwards, whence it becomes desirable to separate in description these varieties of free reed instruments.

The harmonium has a keyboard of five octaves compass when complete, from C to C, and a simple action controlling the valves, etc. The necessary pressure of wind is generated by bellows worked by the feet of the performer upon foot-boards or treddles. The air is thus forced up the wind-trunks into an air chamber called the wind-chest, the pressure of it being equalized by a reservoir, which receives the excess of wind through an aperture, and permits escape, when above a certain pressure, by a discharge valve or pallet. The aperture admitting air to the reservoir may be closed by a draw-stop named "expression." The character of the instrument is then entirely changed from a mechanical response to the player's touch to an expressive one, rendering what emotion may be communicated from the player by increase or diminution of sound through the greater or less pressure of wind the reeds may be submitted to. The drawstops bearing the names of the different registers in imitation of the organ admit, when drawn, the wind from the wind chest to the corresponding reed compartments, shutting them off when closed. These compartments are of about two octaves and a half each, there being a division in the middle of the keyboard scale dividing the stops into bass and treble. A stop being drawn and a key pressed down, wind is admitted by a corresponding valve to a reed or vibrator. Above each reed in the so-called sound-board or pan is a channel; a small air chamber or cavity, the shape and capacity of which have greatly to do with the color of tone of the note it reinforces. The air in this resonator is highly compressed at an even or a varying pressure as the expression stop may not be or may be drawn. The wind finally escapes by a small pallet-hole opened by pressing down the corresponding key.

(*To be continued.*)

THE AGE OF INVENTION.

MODERN SCIENCE APPLYING WASTE MATERIAL TO USEFUL PURPOSES.

We often speak about the triumphs of invention, and mean thereby the conquest which science and mechanism are constantly making over the forces of na ure. And it is indeed wonderful how many of nature's raw materials enter into the manufacture of articles used to satisfy man's daily needs and comforts. But the wonders of production are not confined alone to minerals dug from the earth's bosom, or to the organic life which flourishes upon its surface. On the contrary, man's inventive skill has perfected the art of utilizing waste materials, so that the residue of former arts furnishes the substance upon which new workers expend their labor. Illustrations of this do not have to be sought alone in stores for second-hand clothes and furniture, but rather where new and costly commodities are bought and sold. It is necessary to specify only a few representa-

tive manufactures where the raw materials are waste products, to see the extent to which they are carried on. For instance, millions of bushels of cotton seed have been thrown away in the various States of the south. But now it is utilized in the manufacture of oleaginous products, and promises to be the chief source of many kinds of oils. The slag of furnaces for many years was dumped into ravines and piled upon vacant fields until it had accumulated in vast quantities, but now it is being mined again, re-smelted in some instances, made into asbestos or used in ballasting roads. Paper is made mostly from waste materials, and it enters into the composition of a thousand things, from a cigarette wrapper to a car wheel. Blood is manufactured into door knobs, shutters and doors are made from wood pulp, sawdust is a most useful article, dust and dirt are transformed into multitudinous building materials, while the waste products of the gas house are more valuable, if possible, than the original substance. It was formerly supposed that clay was useful only for embankments, for making bricks or pottery. But now a most useful and beautiful metal is extracted therefrom, and clay banks, rich in aluminum, will soon be as valuable as iron mines. And so the catalogue might be extended indefinitely, but this is sufficient to show the variety of uses to which waste products are put. It also shows a tendency to economy in manufacture, which is one of the hopeful signs of the times.

AMERICAN SILVER.

A NEW LAW AUTHORIZING THE ADOPTION OF NEW DESIGNS FOR SILVER COINS.

A bill has passed the House of Representatives, giving authority to the Director of the Mint, with the approval of the Secretary of the Treasury, to change the patterns and styles of the United States coins. As soon as the bill passes the Senate, which it is thought will be in a very short time, Director Leech will advertise for designs, and the contest will be thrown open to all amateurs and professionals, with awards of $500 for each design accepted. Up to the present time the law has not permitted any alteration in the coins of the nation, save by special act of Congress in each case. But the passage of the bill referred to will give the Director of the Mint, with the Secretary's approval, power to make changes according to his discretion once in twenty-five years. "We are going to have something entirely new for the silver dollar," said Director Leech to a *Star* reporter. "Designs on coins ought always to mean something, but I should like to know how that Philadelphia schoolmarm's head signifies liberty. We shall drop her and put in her place something very different—maybe a head of Washington, but that remains to be determined, and leeway will be given to the artists who contend, in order that the greatest variety of ideas and suggestions may be obtained. As for the eagle on the other side, it must go. We want an eagle in place of it that is of the heroic type and doesn't look like a turkey buzzard." "How about the half-dollar?" "That, as well as the other subsidiary coins—the quarter and the dime—needs alteration. All the three have the same designs. The eagle on the back seems to me a very creditable sort of bird, and I rather think we shall retain it as it is, but the slab-sided young female sitting on a cotton bale we shall do away with. I don't know what we shall put in her place, but we certainly don't want her." "And the penny?" "The Indian must be wiped out. It is a well executed head, artistically speaking, but the law says that the design on the face of the penny must typify liberty. I don't see how an Indian typifies liberty, unless it is liberty very badly abused, with an overdose of bad whiskey thrown in. We shall put something in place of the red man, though I haven't a notion what, at present. Designers make their own suggestions. The nickel, as it is now, is a pretty fair looking coin, I think. Whether or not it will be changed I have not yet determined, The gold coins will not be altered. They are adaptable as they are now. Because of their greater value, more trouble was taken originally in the designs for them. The stars around the edges of the subsidary coins will be increased in number to correspond with the number of States in the Union as it now is. Colonel Bob Ingersoll, in the last number of the *Arena*, declares it an outrage that the words 'In God We Trust' should appear on United States coin; but I am not prepared to say that the motto will be removed. When the bill has passed the Senate giving me the authority, advertisements will be made for designs for the coins in open competition. Probably the Secretary of the Treasury and myself will call into consultation a number of first-rate artists who will give us their judgment in the matter. When the time comes competitors should send in their designs, if possible, in the shape of models of plaster or papier maché, or any convenient substance, and not merely drawings. Here is a great opportunity for some ingenious person to earn fame and a pretty sum of money by turning out one or two acceptable suggestions." Doubtless the advertisement of the Director of the Mint will be accompanied by some definite instructions as to what is required in a general way, so that there will be something to go upon. If the artist is ordinarily vain, he may hide somewhere in the design the initial of his last name. On the silver dollar at present is the initial "M." of the designer in two places on the edge of the neck of Liberty, where it is cut off close to the hair, and on the other side of the coin, where the buzzard clasps the arrows and olive branch in its claw. The $20 gold pieces—handsomest of all Uncle Sam's coins—shows the initials of the designer, "J. B. L."

BOTTLE BLOWING.

BRITISH MANUFACTURERS COMING TO THE FRONT WITH IMPROVED PROCESSES.

The glass industry of this country has attracted unusual attention of late, and evidence, lately revealed, shows that the whole trade under present conditions is a highly profitable one. The value of glass and glassware imported last year amounted to nearly $8,000,000, Germany being the chief contributor. Of these imports, about $1,000,000 represented the value of botles, vials, etc. Outside of this country, the manufacture of glass bottles has been largely dominated by Germany, owing to the cheapness of labor there. German competition, for some years past, has put the British glass bottle blowers quite on one side. The latter have not sat down quietly under the circumstances. They have investigated, experimented and invented; and as a result such improvements have been introduced as promise to revolutionize the trade. Under the old system the ingredients from which glass bottles are fashioned are reduced to a molten state in a small furnace or tank. The men, for convenience, work in gangs of three, of whom two are blowers and the third is the finisher, the last-named operative being generally able to keep two blowers at work. The work of a blower is to gather up on the further end of his blow-pipe a portion of the melted composition. The quantity, of course, varies in proportion to the size of the bottle to be manufactured; and by long practice workmen generally become very expert in taking up the exact quantity. The liquid, after having received a preliminary blow to form a hollow in the centre of the metal is then put inside of an iron mould, which gives the bottle the requisite shape when the blowing process is repeated. The bottle is then passed on to the finisher, the principal part of whose work is to give a better shape to the lips of the bottle than is imparted in the first branch of the work. The bottle is then annealed by being subjected to considerable heat in a kiln for two or three days. The cost of labor under the above process is manifestly great in proportion to the value of its product. The new method is directed to the double object of decreasing the labor required and improving the finish of the bottles. It dispenses with the bottle finisher, and enables 25 per cent. more work to be done with the reduced gang, and at the same time renders breakages less frequent owing to dispensing with the handling occasioned by a boy passing the bottles from the blowers to the finishers. The improvement is simple. The mould or stamp of the old process is taken pretty much as it stands, and to it is fitted a collar with a knife-cutting edge at the extreme top. The service performed by the collar in conjunction with a corresponding plug with a similar knife-cutting edge immediately above it is to execute the work formerly done by the finisher, whose more skilled work demands a higher rate of remuneration than that of the blowers. The operation is performed by pedal pressure with the utmost accuracy and neatness, and the bottle is then ready for what is called in the new process glazing, and which imparts a higher finish to the lips of the bottle than was possible under the old system. The apparatus includes a sort of invertible iron box or cage, which holds the bottle mouth downwards over a Bunsen burner while a smooth gloss is being given to that part. The manual work entailed is performed by a boy, who seems to have really less work to do than in transferring the bottles from the blowers to the finisher in the old process. The Manchester (Eng.) Glass Bottle Company, who are working the invention, assert that they will be able to turn out their wares at a price which the continentals will not be able to touch. The great advantage in the new process is that while it gives such results as have been described, it upsets no existing appliances, but demands only two trifling additions to the plant already in operation under the old system.

SOAPSTONE.

ITS RESISTANCE TO ATMOSPHERIC INFLUENCES.

A writer in a London journal calls attention to the unappreciated uses and preservative qualities of soapstone, a material, he says, which possesses what may be regarded as extraordinary qualities in withstanding atmospheric influences, those, especially, which have so much to do with the corrosion of iron and steel; and, from experiments made, it is said that no other material is capable of taking hold of the fibre of iron and steel so readily and firmly as this. In China, soapstone is largely used in preserving structures built of sandstone and other stones liable to crumble from the effect of the atmosphere; and the covering with powdered soapstone, in the form of paint, on some of the obelisks in that country, composed of stone liable to atmospheric deterioration, has been the means of preserving them intact for hundreds of years.

THE FIRST FEMALE SURGEON IN AUSTRIA.—Medical circles in Vienna are said to be somewhat disturbed by an official order granting to a lady, who had graduated at Berne University, the right of practising in Austria as an ophthalmic surgeon. Before this time even Austrian gentlemen who had graduated at a foreign university have been prevented from practising in Austria.—*Weekly Med. Review.*

AN OLD ART.—According to Dr. Julius Weissner, paper making is proved to have originated in the East. By a careful microscopical examination of ancient Oriental parchments, he has discovered that linen rags were used for this purpose as early as the eighth and ninth centuries. The process of "claying," too, which has been thought a modern device among paper makers, obtained at that period.

ESCAPING TORTURE.—An Iowa damsel showed her good sense by running away from her home, where she was compelled to practise at the piano for five hours a day. She probably saved herself thereby from a life of chronic invalidism. A girl who would run away sooner than practise so long may be safely assumed to be physically incapable of such a prolonged strain, or devoid of the talent which would warrant the expenditure of time. When we are told, in addition, that she preferred to help her mother with the housework, we are moved to add that some mothers fail to appreciate their blessings.

EDIBLE BIRDS' NESTS.

WHAT THEY ARE AND HOW THEY ARE UTILIZED.

Travelers going from Hong Kong to Bangkok or Singapore by steamer pass along the coast off Annam and near a group of islands that are at once picturesque and curious. Behind them is Tourane, an ancient French settlement, the stopping place of steamers bound for Hue and Haiphong, and destined to be an important commercial port in a not very far distant future. Several of these islands produce an important article of commerce—that is, the edible birds' nests, which have caused considerable learned discussion among scientists. They are as dear to the Chinese palate as the Chinese purse. It is a singular fact that Annam is the only country that produces them. Why the swallows select this locality as a habitation, and no other, when there are islands apparently as eligible scattered all along the Asiatic coast from Sumatra to Korea, is a mystery that the scientists who have given the subject so much attention have never attempted to elucidate. Had Banquo lived in these times, he might have given an explanation as poetic and reasonable as that which he gave to Duncan for the preference manifested by the Scotch martins for the pure and delicate air that bathed Macbeth's castle. The swallows' nests are a source of riches to the region. Their value is said to have been discovered some hundreds of years ago, during the reign of Gia Long, who promised a liberal reward to any one who would discover a new and profitable article of export within his realm. The nests discovered on the island of Nam Ngai were presented to the sovereign, who, faithful to his promise, offered a patent of nobility to the finder. This was respectfully declined, and instead a monopoly of the harvest was accepted by the discoverer for himself and his descendants. This privileged family was to pay yearly eighty pounds of the nests to the Emperor as royalty. On the other hand, they were to be exempt from personal taxes, from military service, and from contributions of personal labor, such as are common in Oriental countries. They formed a family league of forty or fifty men, elected two of their number as leaders, under the title of *gnan* and *doi*, and founded a village convenient for their commerce, which still exists under the title of Yen Xa—"Village of the Swallow's Nest." The nests are a product of a salivary secretion of the birds. As to their mercantile value, they are divided into three distinct categories. The most valuable are those into which there enters a certain proportion of the blood. These are called *yen huyet*. Singularly enough, they can only be produced by the birds affected with a malady which resembles consumption, and which is attended with copious hemorrhage. Nests of this kind are in great demand. They are rare, and are gathered only in the spring. Local tradition says that these birds died of exhaustion, or of consumption in its advanced stages, before the end of the second winter. Scientists being scarce among the Annamese, and the French colonists not having yet had sufficient time for observation, it is not known whether this disease is peculiar only to a part of the birds or whether the salivary secretion that causes the malady causes the death of all of them after a year or two of existance. The smallness of the quantity of these nests annually gathered—which is only three or four pounds—would seem to indicate that the disease is only partial and peculiar to those possessed of the weakest lungs. All other nests (*yan soo*) are classed as second quality. Nothing but the saliva of the bird enters into their construction. They are gathered in the spring, summer and autumn. The spring harvest is the most valuable because it includes the two qualities. Two nests of the first quality weigh one ounce, and are worth at the place of production five Mexican dollars at current value in Annam. Those of the second quality are worth little more than half as much. The summer gathering is entirely of nests of the second quality. They are smaller and less compact. It requires four of these to make an ounce, which is worth two Mexican dollars. The autumn harvest is still less valuable. The nests are scarce and not highly esteemed. It requires seven to make an ounce, which is not worth more than $1.20 to $1.40. Experts express the opinion that this third gathering should be dispensed with, since it is worth so little and there is danger of destroying the eggs. Nearly all the nests are sold to the Chinese living in the cities of Annam and Tonquin or sent to Chinese ports. Only the Chinese and some high mandarins of the Court of Hue, who prefer the Chinese *cuisine*, can afford the luxury. They are eaten by the Chinese cooked with flesh or with sugar, having first been cleaned of all extraneous substances by a liberal application of hot water. When cooked with fowl or game, fruit of the water lily is added. Chinese physicians prescribe them as a sovereign remedy for diseases of the lungs, asthma, disordered digestion, and most other maladies. If they have curative qualities of the kind mentioned, they probably share them with other alimentary substances containing more or less gelatine. The good qualities of the nests are estimated no doubt in proportion to the price. It is certain that, as an article of diet, they have made little impression on Western nations. The harvest is made in a manner simple and picturesque. Sections of bamboo are thrust into holes all the way up the precipice, forming an immense ladder by whose rounds the coolies ascend, detaching with a knife as they go the nests glued to the walls. One of the family which monopolizes the industry watches meanwhile anxiously below to see that the laborer does not in gathering detach some portion of the precious nest and secrete it about his person. The operation is full of danger, and annually costs several lives. The monopoly is at this moment in danger of passing into other hands. A rich Chinese company of Hong Kong, which is building a handsome European hotel at Tourane, and which has branch houses in the principal cities of Annam and Tonquin, is offering the Hue government a handsome bonus for the privilege of gathering the nests. The monopolists are greatly excited at the prospect of losing it, and in support of their claim are offering in evidence the very document given to their ancestors by the Emperor Gia Long. Money is needed at the court of Hue, and the ancient manuscript will be critically scrutinized by Annamese officials to discover if it is indeed a grant in perpetuity or whether there is not a chance to make a good round sum by the transfer. In the meantime the swallows, instead of seeking haunts free from invasion, come back punctually with every recurring season, regardless of their health and this increasing spoliation. Other swallows in other countries can return peacefully to their last year's nest in the ensuing spring. These swallows of Annam must keep on pandering to an aristocratic desire, building and rebuilding their homes and giving their life's blood forever to satisfy a diseased appetite.

MINIATURE TRANSPORTATION.

THE SMALLEST RAILROAD IN THE UNITED STATES.

The most diminutive railroad in all Down East, according to a newspaper exchange, is that owned and operated by the Monson, Maine, Slate Co., running from the company's quarries to Monson Junction, on the Bangor and Piscataquis. This little road has a 2 ft. gauge, is about 6 miles in length, and is thoroughly equipped with locomotives, passenger, baggage, and freight cars, has several stations, regular time tables, and a superintendent. The superintendent is also conductor, baggage master, mail agent, passenger and freight brakeman, news agent, and director—a regular Pooh Bah—and for performing all these offices he gets $900 a year. Ten men constitute the entire force of the road. The trains average about 50 miles a day in summer and 25 miles in winter. The road is all down hill one way, so that a car will run from the quarries to the junction without the assistance of a locomotive. If a passenger misses the regular train, $5 will secure a special to carry him over the line. Last year this toy road carried 9,000 tons of the company's freight to Monson Junction (6 tons to a car) for transshipment over the Bangor and Piscataquis to Bangor and points west, and 4,200 passengers, who paid $12,000 in fares, were transported at a cost of $9,000. This little road has been in operation six years, and in all that time no accident of any kind has occurred on its line. We judge it to be the smallest independent line running regular trains for both freight and passengers in America.

HEATING HOUSES.

A FRENCH VIEW OF WHAT IS ESSENTIAL IN STOVES.

Heating, besides its great importance to mechanical, industrial and commercial interests, is among the most important agencies in domestic economy in its relation to comfort and good health. Notwithstanding the wonderful advancement the last few years have made in heating apparatus, the portable stove is yet extensively used in the houses of the poorer classes and the well-to-do, menacing health and even life. As so great importance were the evils arising from this source considered to be that the subject was presented before the Academy of Medicine in Paris by Dr. Lancereaux, who had made extensive observations on carbonic oxide poisoning, due to defective manufacture or placing of portable stoves in residences or vehicles. Dr. Lancereaux was in favor of recommending governmental control, and proposed the following measures:

1. To authorize the sale of stoves only on condition that their draught be sufficient to convert all the carbon present in the fuel into carbonic acid, and thus prevent the formation of carbonic oxide gas.

2. To require an examination of the chimney before the above is put up, in order to ascertain that its draft is sufficient for the disengagement of the vapors of combustion, as well as an examination of the neighboring chimneys, in order to prevent filtration from one chimney to another, and to protect those immediately interested, or their neighbors, from poisoning by carbonic oxide communicated from a distance.

3. To warn the public of the danger incurred by passing the night in a room in which there is a stove of slow combustion, or in a room that adjoins one in which such a stove is placed.

In the discussion that followed it was stated by the friends of the measures that the dangers from this source was too little understood. M. Armand Gautier said that five millimetres of carbonic oxide in the surrounding air provoked poisoning in one-eighth of the total blood. According to M. Laborde, the presence of carbonic oxide in the atmosphere in the proportion of 1 to 650 is injurious to life. Arguments were made against supervision, but the friends of the measure succeeded in gaining their cause before the Academy, and the following resolutions were adopted:

1. The use of economic heating apparatus of feeble draught should be authoritatively prohibited for sleeping rooms and apartments adjoining sleeping rooms. The use of portable stoves in general should be avoided.

2. In all cases, the draught of an air-tight stove should be suitably guaranteed by pipes or chimneys in one section and of sufficient height, completely air-tight, presenting no fissure communicating with adjoining apartments, and discharging above the level of contiguous windows. It would be well to have the chimneys or pipes supplied with apparatus for indicating that the draught is in the normal direction.

3. It is necessary, especially when the stove is at a low rate, to guard against atmospheric disturbances which might diminish the draught, and even cause a re-

flux of gas into the interior of the room in which the stove is burning.

4. Every stove of slow combustion which has hot-air openings should be rejected, as, by suppressing the utility of the safety chamber made by the interior cylindrical hollow comprised between the two sheetings of cast or wrought iron, they permit the escape of carbonic acid gas into the apartment.

5. The openings by which an air-tight stove is supplied with fuel should be hermetically closed and ventilated whenever fresh fuel is put in.

6. The use of this heating apparatus is dangerous in rooms habitually occupied which are not freely ventilated from the outside. It should be prohibited in nurseries, schools and colleges.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

June.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb.

FRUITS.—Cherries, strawberries, bananas, pineapple.

PRACTICAL RECIPES.

BROILED KIDNEYS.—Dip three kidneys in boiling water; open them down the middle, but do not divide them; peel them; string them on a skewer, to keep them open, and dip them in a mixture made as follows: Melt three tablespoonfuls of butter; chop fine a tablespoonful of parsley; mix it with the butter; also one teaspoonful of lemon juice, and salt and pepper. Dip the kidneys into this, and broil over a good, clear fire, cooking the cut side first. Remove the skewer before serving, and put a piece of butter in the centre of each kidney.

MIXED SALAD.—Wash and dry a good crisp head of lettuce and a handful of cresses; peel and slice a few crisp radishes and one or two small cucumbers; peel and slice a large boiled beet. Put one teaspoonful of mustard and two of sugar in a salad bowl, and mix slowly with them two tablespoonfuls of oil; then add by degrees four tablespoonfuls of milk and very slowly one tablespoonful of vinegar. Put the vegetables together, pour the dressing over them *just before serving*, toss lightly with a fork, and serve.

CHERRY ROLY POLY.—Make a dough of half a pound of flour, five ounces of suet freed from fibre and skin, a pinch of salt, and enough ice water to make it stick together. Roll out about an inch thick; put on it one pound of cherries that have been stoned; sprinkle plentifully with sugar; roll up, tie in a floured cloth, leaving room for it to swell, and boil steadily for two hours. Serve with hard sauce, flavored with brandy.

BREAST OF MUTTON.—Trim carefully, boil in salted water till tender, remove the bones, spread with a rich forcemeat, roll up and tie, dip in egg and sifted bread crumbs and brown in the oven. Serve with jelly.

PINEAPPLE CAKE.—Make a good cup cake; one cupful of butter, two cupfuls of sugar, three cupfuls of flour, one cupful of milk, four eggs, two teaspoonfuls of baking powder, and bake in several layers. Peel a pineapple, remove the heart and eyes, chop fine, cook it with one pound of sugar until transparent; while hot, add one-quarter box of gelatine that has been soaked in cold water one hour. When cold, spread this mixture over the layers; put them together and spread the top with an icing flavored with lemon.

POTATO CAKES.—Take four cupfuls of hot mashed potatoes; rub into them two large tablespoonfuls of butter; add two pounds of flour, salt, and sufficient milk to make a stiff batter; add half a cup of yeast, and set to rise; when light, bake in muffin rings.

FRIED CAULIFLOWER.—Boil a cauliflower, cut into small pieces, and fry in hot butter; sprinkle with salt and pepper, and serve.

CENTRAL PARK.

HISTORICAL STATISTICS OF NEW YORK'S SPLENDID PLEASURE GROUND.

The Central Park cost the city about $6,000,000 for the land and about $13,000,000 for construction and maintenance. It is now about forty years old, and the total cost of it has not been as much expense as for three weeks' cost of the late war of the rebellion. About forty years ago the idea of constructing a great public park for the city was agitated by A. J. Downing, a famous landscape gardener of that day. In 1851, Mayor Kingsland urged the subject upon the Common Council, which promptly recommended the selection of Jones' Wood as the site for the new park, and the same year an act of the Legislature adopted that plan. Subsequently the Common Council recommended a change of site to the present location, which was adopted by the Legislature in 1853, fixing the northern limit at 106th Street, and the city got title to the property in 1856. The first Commission for the management of the Park consisted of Mayor Wood and Street Commissioner Taylor. The chief engineer was Mr. Egbert L. Viele, and the Advisory Committee was Washington Irving, Charles P. Briggs, James Phalen, and Stewart Brown. A new Board of Commissioners was ordered by the Legislature of 1857, of which J. R. Cooley was President and Andrew H. Green Treasurer. The work of clearing the ground began in August of that year. There were no expensive buildings within the area and most of the structures were squatter's huts. In December there were 1,120 men at work. In August, 1858, there were 2,000 men at work. The first tree was planted in October, 1858. Water was let into the lake, and the first skating was had in December of that year. The first finished parts prepared for public use were the Ramble and the Mall. The great trees which now ornament the Mall were all set out at this time, and they were the largest trees ever transplanted. In 1859, the northern limits were extended to 110th Street, and the old Boston road through the Park was closed. At this time there were 3,000 men at work. In July there were 3,800 men at work, using forty barrels of gunpowder daily. The first public concert in the Park was given in July, 1859, by private contribution. In the following September there were three and a half miles of drives and the first transverse road was declared open. In December the construction south of 79th Street was declared complete. During that year 17,300 trees and shrubs were planted, including most of the deciduous trees south of Seventy-ninth Street. The average number of men employed was 3,879. In May, 1860, twelve swans were presented to the Park by the city of Hamburg. In October following Mrs. Crawford presented casts of the Crawford sculptures; the Vintners' Company of London presented twenty-four swans, and the Dyers' Company of London presented twenty-five swans. The next month the city of Hamburg presented ten more swans. There were 16,200 trees planted this year. During the war a number of volunteer soldiers were quartered in the old arsenal in the Park. The regular boat service on the lake commenced in April, 1861. This year there were seven miles of drives in use, and there were 52,700 trees and shrubs planted. In 1862 there were 74,730 trees and shrubs planted, and Mount St. Vincent building was used as an army hospital. The city of Philadelphia presented the Park with eight deer in September, 1863; the Commissioners first assumed the cost of the concerts; the number of visitors was 4,326,500. In 1864 Manhattan Park was annexed to Central Park. 20,000 trees and shrubs were planted, and a lady introduced seven pairs of English sparrows, the pioneers of the pests of the city to-day. Over 6,000,000 visitors enjoyed the Park this year. In 1865 the statue of Commerce was presented, schoolboys were first permitted to play ball in the Park, and the number of visitors was 7,000,000. The Harlem Mere and the Kinderberg, a rustic arbor for children, were completed in 1866. The next year the Belvidere, the great children's play ground, was commenced. The bronze statue of "The Tigress" was presented, and the art gallery with the Crawford collection was opened at Mount St. Vincent. The first hothouse and the meteorological observatory were established. The Palæozoic Museum was commenced in 1868, and the bronze statue of the "Indian Hunter," by J. Q. A. Ward, was presented. The bust of Humboldt was presented in 1869, the statue of Columbus the same year. "The Dairy" was opened, and the movable skating house and curling houses were constructed. During this year there were 12,522 trees and shrubs planted, a Museum of Natural History was established in the arsenal, steam rollers were first used on the Park roads, and the boys' playhouse was opened. Under the charter of 1870 the Department of Parks was established, the, Zoological Garden and the Carrousel were ordered to be laid out, and the plans for the conservatory were prepared. In 1870 the Sheepfold was commenced, and the number of visitors was 8,628,826. In 1871 the stables and workshops were commenced, and the number of visitors increased to 10,764,411. In May, 1873, the Bethesda Fountain was inaugurated. The number of visitors this year was 10,063,159. These points cover the main features of the Park as they exist to-day. The great museums and art galleries of the Park are almost entirely due to the efforts of public spirited citizens, the value of whose gifts and loans rivals the expenditure of all the public money expended on the Park. Making a rough estimate of the cost of the Park and the numbers who have visited it, the actual outlay has been about five cents of public money for each visitor, and the city of New York has more than got its money back in the taxation on the increased value of adjacent property.

EYE STONES.

THE TRUE CHARACTER OF THE STONES THAT SWIM IN THE HUMAN EYE

Eye-stones are really portions of the covering of certain shell fish. They are found at the opening of the shell, and serve to close the entrance when the animal draws itself within. They are of various kinds, but those used as eye-stones are hard, stony bodies, about the size of split peas, one-third to one-sixth of an inch in diameter, a little longer than broad, having one surface plane and the other convex. When they have been worn by the action of the sea, they are very smooth and shining. Like other shells, they are composed of carbonate of lime. When placed in a weak acid, such as vinegar, a chemical change takes place, carbonic acid gas is given off, and in its escape produces the movement which are popularly supposed to show that the stone is "alive." When one of these stones is placed under the eyelid, at the outer corner, the natural movements of the lid in winking push it gradually toward the inner side, and when it comes in contact with the mote which is causing the irritation, this is carried along and finally expelled with it. The belief that such stones have a peculiar detective power, and move about in the

eye until they find and remove the irritating substance for which they have been " sent," has no foundation in fact. It is interesting to know that in the lining membrane of the stomach of the crawfish, there are found small bodies which go under the name of "crab's eyes,' and look not unlike the true eye-stones. They have sometimes been mistaked for them, and presumably would serve a similar purpose.

BUSINESS NOTES.

ALDEN'S MANIFOLD CYCLOPEDIA.

The title "Jordan" begins, and the title "Legacy" ends Volume 21 of ALDEN'S MANIFOLD CYCLOPEDIA, and between these titles will be found a wonderful amount of interesting and valuable information. The editorial skill in selecting the subjects treated, the amount of space given to each of the various topics, and the clearness and conciseness of treatment, are most commendable, and stamp this cyclopedia as, above all others, the cyclopedia for the people. A feature of very great importance, not found in any other cyclopedia, is the pronunciation of all titles, the names of persons, countries, etc., as well as of the ordinary words found in a dictionary. Among the great number of interesting subjects treated in this volume we notice: Jurisprudence, Jury, Jute, the States of Kansas and Kentucky, very full and brought close down to date, Knights of Labor, Latin Language and Literature; also biographical sketches of such noted and interesting characters as Josephus, Junius, Kent and Kant, Clara Louise Kellogg, Mrs. Kemble, George Kennan, Louis Kossuth, Lafayette, Gen. Robert E. Lee. The Manifold Cyclopedia cannot be too highly commended for the use of families and schools, and especially for all young people who are attempting to educate themselves. The low price, also, quite beyond comparison with any other cyclopedia of similar character and magnitude, is a gratifying feature. Specimen pages and terms will be sent on application by the publishers, GARRETSON, COX & CO., New York, Chicago, and Atlanta.

BUSY PACKERS.

This is the busy season with Gordon & Dilworth. Up early in the morning to get the pick of the choice fruits; everything rushing about the factory; teams hauling in fruits; sorters picking it over and washing the berries, cooking, canning, labelling, boxing and shipping. Every one around the office equally busy; open till late in the night. It is a sight that not only gladdens a business man's heart, but every housewife would be delighted to see the wonderful care and cleanliness of hands and vessels. In fact, this factory is a model one, and accounts in a measure for the great success of the Gordon & Dilworth brand.

HORSFORD'S ACID PHOSPHATE

For sunstroke. It relieves the prostration and nervous derangement. Dr. H. C. McCoy, Algona, Ia., says: "I have used it in cases of dyspepsia, nervous exhaustion and wakefulness, with pleasant results. Also think it of great service in depressed condition of the system resulting from biliary derangement."

INTERCEDING FOR PORK.—Adam Clark, in returning thanks at the table of another, made use of the following significant and pertinent words: "Lord, bless these vegetables and this fruit and bread; and if thou canst bless under the gospel what thou didst curse under the law, bless this swine's flesh also."

ELECTRIC COFFEE MAKING.—We have heard of bread-cutting and boot-cleaning by electricity, and are now told by a German technical magazine (the *Elektrotechniker*) that the coffee in a certain Berlin cafe is brewed by the same agent. In the centre of the room are several large glass jars, through which passes a platinum wire in spiral form. The electricity, on heating the wire, speedily raises the temperature of the water in the jars to the boiling point and prepares the coffee in the sight of everybody. Lastly, a small electric railway transmits the coffee to the various tables, so that the guests may help themselves to their liking. —*The Caterer.*

"ENGLISH AS SHE IS WROTE."—A hotel in Rome, anxious to secure English patronage, has set forth its advantages in the following advertisement, which is placarded about Paris: "The Hotel de ——, the very most favorite resort by English and American travelers, as during the winter presents all kinds of comforts for what concerns the general heating, during the summer is just fitto afford the freshest and most the wholesome temperature on account of its special position, breadth and ventilation. The largest and most monumental table d'hote there is to be found."

EARLY START.—The youngest great-grandmother lives near Pomona, Cal. Her name is Francesca Cordolla, and her age is but fifty years. She was married when but fifteen years old, and her eldest daughter married when she was a little over seventeen years old. Mrs. Cordolla was but thirty-three years old when she was a grandmother. Her eldest granddaughter was married April, 1889, at the age of fifteen years, and now a great-granddaughter is born.—*The Sanitary Era.*

OBSCURE JOKE.—"I have observed," remarked a mean old bachelor, trying to be funny, "that when one has fortune and adds Miss to it he has misfortune thereafter." Then you ought to marry a widow," responded a lady in black, and the funny man went into his shell

ELECTRIC TANNING.—An experiment with electricity for tanning purposes was lately made in England. The process was accomplished in a revolving drum, 12 feet in diameter and 8 feet long, rotating at eight revolutions a minute. Turpentine and tannic acid were used to saturate the hides, and a strong current of electricity was caused to flow from a metal band which runs around the interior of one end of the drum to a corresponding band on the other end. The drum, after revolving five days, was opened, and the leather appeared to be of excellent quality.

A BUSINESS BENEFIT.

ADVANTAGES TO ADVERTISERS OFFERED BY THE AMERICAN ANALYST.

It has not the limitations of a daily paper. No one reads yesterday's paper. A monthly lives at least a month, while a weekly is fresh four times a month, and its audience is not limited by geographical lines, but the circulation is all over the United States and Canada.

It contains matters of interest to everyone, especially the ladies of the household, and is, therefore, sure of a careful perusal. Our audiences are intelligent and of the better classes, who have money to spend, and any well worded advertisement in our columns, giving real information, will receive a careful perusal.

Our rates are as low as our circulation affords. Large circulation and original matter cost money, and those advertisers who desire to realize these benefits must expect to pay reasonably for them.

Advertisements in our columns are permanent. Most of our subscribers bind their numbers.

Our advertisements are set up in an attractive form, sure to call the attention of the reader.

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CONTENTS.

A MIGHTY EMPIRE.

In April next a census of the British empire will be taken, and its result will, it is believed, fully justify the boast of our British cousins that in material greatness their imperial domain surpasses all empires recorded by history. It is certainly an impressive thought that from the little island of England is sent forth the governing influence of an empire with which that of Rome in the zenith of her power will not bear comparison, though the name of Rome is still accepted by the world as the standard of vast power. The forthcoming census above referred to, will, as far as possible, cover the British Empire, and it is the intention to make it the most comprehensive yet taken. To this end the schedules will be simplified. No inquiries will be made as to religious faith or creed, and those bearing on occupation will be condensed. The census will be stripped of everything that could make enumeration cumbersome, and the great end and aim will be to ascertain the number of subjects of Queen Victoria. There are sections of her dominions where only approximations are possible. But making all allowances, the forthcoming census will doubtless show that the British Empire has somewhat more than 330,000,000 enumeratable inhabitants. The current calculation is that at the opening of the year 1890 the population of the British Empire was very nearly 328,000,000, of whom 38,125,000 were dwellers in the United Kingdom, 271,180,000 in India, and the remaining 19,000,000 in other possessions. Two years ago the Indian Government estimated the population of British India at 208,793,350, and that of the native states at 60,684,378. Practically all India is under British control, and may be so reckoned in estimating the population. The empire has grown in extent greatly since the census of 1881 was taken. Upper Burma was conquered in 1886, and thereby 5,000,000 more people were brought under British sway. Within the last five years Bechuanaland, British East Africa, British Zambesia, the Niger District Protectorate have been brought within the sphere of British influence, and Zululand and Nyassaland, which were not within the scope of the British census maker in 1881, are to-day British possessions. In Borneo, under the thin disguise of commercial enterprises, Great Britain has acquired large possessions. The population of the most recently acquired African possessions back from the coast can only be guessed. Assuming that the various unascertainable elements of native populations in all her possessions foot up 10,000,000 and that the natural rate of increase has been maintained, the British empire will probably be shown to have not far from 340,000,000 population enumerated and estimated. Behm and Wagner estimated the population of the world in 1882 at 1,433,887,500 souls of which Europe had about 328,000,000, or 12,000,000 less than the expected result of the British census of 1891.

IS OUR CLIMATE CHANGING?

At a recent meeting of the Academy of Sciences the observer in the Government signal service station in this city, Sergeant Dunn, presented an instructive address on the appearances of changes in our climate. The theory that the climate in this latitude has undergone a change has been quite widely entertained, and there are some recorded facts that strengthen the idea. Since 1876 there has been an increase of heat in the city, except in 1885, 1886 and 1888. These years show a slight decrease. In not a single year up to 1882 did the city receive its full amount of heat. In most years the winters were long and severe. In 1882 the mean temperature just equalled the normal. Since then, except in the three years mentioned, there has been a surplus of heat, and in the past two years the surplus has been most marked. The year 1875 was the coldest on record, and showed a deficiency of 1029 deg.; the year 1889 was the warmest on record, and had an excess of 845 deg. The most noticeable change and increase of heat began with November, 1888. The greatest excesses took place in the winter. August shows a deficency, and strange to say the mean temperature in that month during the past eight years has been below the normal. July and September show a loss of heat during the past two years, but not as great as August. Since January 1, 1890, we find the same excess, only to a greater extent than in 1889. The great increase in heat is held by Sergeant Dunn to determine beyond a doubt that a change has taken place. In the coldest months there has been the greatest excess of heat, and they have been modified sufficiently to compare them favorably with winters in the South, while the hottest months, July, August and September, have a tendency to be cooler than the mean. It seems probable that the summer months will greatly reduce the surplus heat already recorded. If not next winter must be decidedly colder than usual to bring the mean for the year within the range of the past nineteen years. All these reflections relate to New York city, but they also seem applicable to a large part of the northeastern section of the country. If, however, it can be shown that similar variations and gains and losses have not been felt over a large area, the theory, formulated from them, that the climate is changing, falls to the ground.

VISIONARY ISLANDS.

In view of the numerous propositions for the regeneration of society that abound at the present period, a suggestion is made by Mr. Joel Benton, through the columns of *The Open Court*, that opportunity be afforded for giving these various schemes a fair trial, by locating their respective disciples and advocates on remote islands, where the systems could be separately exploited without annoyance to the rest of the world. Mr. Benton does not favor the companionship of visionary theorists —and we presume the great mass of thinking men will give a general acceptance to his protest against their vagaries. Briefly summed up, his opinion is that our present era is in a ferment over fantastic schemes and ideas. The different ways to reform the world are becoming legion. Not long ago Henry George had the public ear mostly to himself; and, if you could only believe him, and the ineffable nonsense which he and his acolytes put forth, we might see all the evil in the world incontinently extinguished by simply empowering the State to confiscate all the realty of landowners and turning it over to the community at large. Another sect pleads for cumulative taxation to prevent people from getting rich, as if it were not a hard enough thing already to attain to that condition. Some would tax legacies stringently or prevent inheritance; and there is really no end of things which glow furnace-like in the heads of perfervid cranks for the proposed betterment of human life and human conditions. Not one of these schemers ever thinks of facts as they are; not one of them offers a cure for crime, unthrift, laziness, debauchery and imbecility. All start upon the idiotic assumption that to be born into the human race is to make pay-

able from society to the individual the same share of the good things of earth which rugged effort, suffering, toil and self-denial allot only to those who have, or who practice, these virtues and traits. Perhaps, Mr. Benton continues, the uppermost nostrum in vogue just now is the Bedlamite scheme of Mr. Bellamy for compacting—under the sonorous phrase "to nationalize"—industry and laziness, sin and virtue, into an inseparable compound, giving equal prizes to all, which is a neat way of nullifying the law of God and the will of civilization, inasmuch as it punishes thrift and virtue and puts a bounty upon crime and laziness. For a nine days' wonder—an exploitation of fool philosophy—it has held its own pretty well, and is still making a precious amount of noise out of all proportion to its title for serious consideration. The iteration and reiteration of its claims have already become nauseating, so that a relief from hearing more of its stridulous folly would be welcome to all sane intellects.

DR. NEWTON'S RESIGNATION.

The resignation of Dr. William K. Newton as Dairy and Food Commissioner of New Jersey has only recently been announced, though it was tendered to the State Board of Health two months ago. He is succeeded in the office by Dr. George W. McGuire, of Trenton. Dr. Newton resigned to accept a lucrative opening in the practice of his profession in Paterson. His labors on behalf of pure food have been of great value, as he brought to his work a well-trained mind and peculiar fitness for a very delicate and important position. He was a close student of all questions relating to food, and knew the literature of the subject as well as any man in the country. He has been President of the American Public Health Association and of the National Pure Food Convention. In his work for pure food in New Jersey he has placed that State first in the list of commonwealths protecting the food supply, raising standards and creating a sentiment in favor of pure food that is of incalculable benefit to the nation as well as to the people of New Jersey. His reports are models for other State officers to copy.

AMERICAN FOOD PRODUCTS ABROAD.

The President, in answer to a House resolution respecting the importation into foreign countries of American breadstuffs and provisions, and the rates of duty imposed upon such articles, has transmitted a letter from the Secretary of State, accompanied by a number of tabulated statements. The Secretary's statement includes Austria-Hungary, Belgium, France, Germany, Turkey, Italy, Portugal, Spain, Switzerland, Sweden, Argentine Republic, Brazil, Canada and Mexico; and from the foot-notes of these tables it appears, says the Secretary, that the importation of American pork and lard into Austria-Hungary has been prohibited since March 10, 1881, and the sale of American canned meat products was prohibited in Hungary in 1884. The importation of American pork into France has been prohibited since February 18, 1881, and all lard imported from the United States is subjected to inspection. The importation of American pork into Germany has been prohibited since January 8, 1880; and of American potatoes since 1875. The importation of American pork into Italy has been prohibited since February 20, 1879. The importation of American potatoes into Spain is prohibited and American pork and lard are subject to Government inspection. The importation of American cattle and swine—except in bond—into Ontario was prohibited April 23, 1880. The importation of American pork into the Ottoman Empire has been prohibited since 1881. Perhaps some of the wiseacres who take every opportunity offered by such official reports as these to say that this is due to our large beef and pork packing establishments sending abroad adulterated lard and improperly cured pork, will devise some equally logical reason for the prohibition of American potatoes.

THE MODERN REED ORGAN.

ITS GENESIS, DEVELOPMENT AND STATISTICS OF MANUFACTURE.

(*Continued.*)

In Mustel and other good harmoniums, the reed compartments that form the scheme of the instrument are eight in number, four bass and four treble, of three different pitches of octave and double octave distance. The front bass and treble rows are the "diapason" of the pitch known as eight feet, and the bourdon (double diapason), sixteen feet. These may be regarded as the foundation stops, and are technically the front organ. The back organ has solo and combination stops, the principal of four feet (octave higher than diapason), and bassoon (bass) and oboe (treble), eight feet. These may be mechanically combined by a stop called full organ. M. Mustel, the French maker, whose pre-eminence is universally acknowledged, has added other registers for much admired effects of tone, viz.: "harpe eolienne," two bass rows of two feet pitch, the one tuned a beat too sharp, the other a beat too flat, to produce a waving, tremulous tone that has a certain charm; "musette," and "voix celeste," sixteen feet; "baryton," a treble stop, 32 feet or two octaves lower than the normal note of the key. The back organ is usually covered by a swell box, containing louvres or shutters similar to a Venetian blind, and divided into fortes corresponding with the bass and treble division of the registers. The fortes are governed by knee pedals, which act by pneumatic pressure. Tuning the reeds is effected by scraping them at the point to sharpen them, or near the shoulder or heel to flatten them in pitch. Air pressure affects the pitch but slightly, noticeable only in the larger reeds, and harmoniums long retain their tuning, a decided advantage over the organ and the pianoforte. Mechanical contrivances in the harmonium, of frequent or occasional employment, besides those already referred to, are the "percussion," a small pianoforte action of hammer and escapement, which, acting upon the reeds of the diapason rows at the moment air is admitted to them, gives prompter response to the depression of the key, or quicker speech; the "double expression," a pneumatic balance in the wind reservoir of great delicacy, exactly maintaining by gradation equal pressure of the wind; and the "double touch," by which the back organ registers speak sooner than those of the front that are called upon by deeper pressure of the key, thus allow prominence or accentuation of certain parts by an expert performer. "Prolongment" permits selected notes to be sustained after the fingers have quitted the keys. Dawe's "melody attachment" is to give prominence to an air or treble part by shutting off in certain registers all notes below it. This notion has been adapted by inversion to a "pedal substitute," to strengthen the lowest bass notes. The "tremolo" affects the wind in the vicinity of the reeds by small bellows which increases the pulsation in rapidity according to pressure; and the "sourdine" diminishes the supply of wind by controlling its admission to the reeds.

The American organ, as already said, acts by wind exhaustion. A vacuum is practically created in the air chamber by the exhausting power of the foot-boards, and a current of air thus drawn downwards passes through any reeds that are left open, setting them in vibration. This instrument has, therefore, exhaust instead of force bellows. Valves in the board above the air chamber gives communication to reeds, made more slender than those of the harmonium and more or less bent, while the frames in which they are fixed are also differently shaped, being hollowed rather in spoon fashion. The channels, the resonators above the reeds, are not varied in size or shape as in the harmonium; they exactly correspond with the reeds, and are collectively known as the "tube-board." The swell "fortes" are in front of the openings of these tubes—rails that open or close by the action of the knee upon what may be called knee pedals. The tone of the American organ is softer than that of the harmonium; this is sometimes aided by the use of extra resonators, as, for instance, in Clough & Warren's latest instruments (of Detroit, Mich.), which they call pipes or qualifying tubes. The blowing being also easier, ladies find it much less fatiguing. To these differences we may attribute its increasing popularity. The expression stop can have little power in the American organ, and is generally absent; the "automatic swell" in the instruments of Mason & Hamlin, of Boston, is a contrivance that comes the nearest to it. By it a swell shutter or rail is kept in constant movement proportional to the force of the air current. Another very clever improvement introduced by these makers, who are the originators of the instrument itself, is the "vox humana," a smaller rail or fan, made to revolve rapidly by wind pressure; its rotation, disturbing the air near the reeds, causes interferences of vibration that produces a tremulous effect, not unlike the beatings heard from combined voices, whence the name. This vibrato stop has found general adoption. The arrangements of reed compartments in American organs does not essentially differ from that of harmoniums; but there are often two key-boards, and then the solo and combination stops are found on the upper manual. The diapason treble register is known as "melodia"—different makers occasionally vary the use of fancy names for other stops. The "subbass," however—an octave of 16 feet pitch and always apart from the other reeds—is used with great advantage for pedal effects on the manual, the compass of American organs being usually down to F (F F, 5 octaves). In large instruments there are sometimes foot pedals as in an organ, with their own reed boxes of 8 and 16 feet, the lowest note being then C C. Blowing for pedal instruments has to be done by hand, a lever being attached for that purpose. The "celeste" stop is managed as in the harmonium, by rows of reeds tuned not quite in unison, or by a shade valve that alters the air current, and flattens one row of reeds thereby.

Harmoniums and American organs are the results of many experiments to play upon free reeds by a key-board, initiated by the "orgue expressif" of Grenie, a Frenchman. During nearly the first half of this century various tentative efforts in France and Germany, and subsequently in England, came to nothing more valuable than the Viennese "physharmonica" of Hackee, the Parisian "melophone" and the "seraphine." The inventor of the harmonium was indubitably Alexandre Debain, who took out a patent for it in Paris in 1840. He produced varied timbre registers by modifying reed channels, and brought these registers on to one key-board. Unfortunately, he patented too much, for he

secured even the name harmonium, obliging contemporary and future experimenters to shelter their improvements under other names; and the venerable name of organ becoming impressed into connection with an inferior instrument, we have now to distinguish between reed and pipe organs. The compromise of reed organ for the harmonium class of instruments must therefore be accepted. Debain's harmonium was at first mechanical; it gained expression by the expression stop already described. The Alexandres, well-known French makers, by the ingenuity of one of their workmen, Martin, added the percussion and the prolongment. The melody attachment was the invention of an English engineer; the introduction of the double touch, now used in the harmoniums of Mustel, Bauer and others, also in American organs, is due to Mr. Tamplin, an English professor. Reference has already been made to the improvements of M. Mustel, a maker imbued with true artistic devotion.

The principle of the American organ originated with the Alexandres, whose earliest experiments are said to have been made with the view of constructing an instrument to exhaust air. The realization of the idea proving to be more in consonance with the genius of the American people, to whom what we may call the devotional tone of the instrument appealed, the introduction of it by Messrs. Mason & Hamlin in 1861 was followed by remarkable success. They made it generally known in Europe by exhibiting it at Paris in 1867, and from that time instruments have been exported in large numbers by different makers. Harmoniums are not entirely, although chiefly, of French make. Mr. Bauer, one of the best English makers, learned the trade in Paris, and employed chiefly French workmen. As keyed instruments, reed organs of either principle cannot be expected to compete musically with the older organ and pianoforte, yet the harmonium, studied for itself with something like the devotion that is given to the other keyed instruments, might be made more important than it is at present. Excepting from a few isolated students who may be told upon the fingers, it has received no true cultivation. Whether it will ever get this is a question that remains to be answered. Commercially, the harmonium and American organ have taken a much more important place, although, of course, not equal to that of the pianoforte. For some years the Alexandres were sending annually 7,000 harmoniums to England. This afterwards, from various causes, diminished; the number, however, of their instruments made up to 1879 has reached 110,000. A general estimate of harmoniums made annually in France, Germany and England is not forthcoming; but the yearly production of American organs in the United States has been stated at the large total of 40,000.

TOMATOES.

THE HISTORY OF THEIR INTRODUCTION IN THIS COUNTRY.

A good many years ago a man who had recently arrived from the Bermuda Islands was sent to York county (Pa.) jail for some offense committed against the laws of the Commonwealth. He had with him a few seeds which be planted in the rich soil of the jail yard. Before the plants which sprung from the seed reached maturity he was discharged, and no one knew the nature of them. They grew luxuriantly, bearing fruit of a large size and unusual appearance. As this strange fruit ripened, its color changed from green to a brilliant red, and became an object of wonder and admiration to all the inmates of the jail. Mrs. Klinefelter, the lady keeper, cautioned all the prisoners against eating any of the fruit, as she was sure it was poisonous, but planted some of the seed, as she desired to preserve specimens of it for him should he return in time. Just when the fruit was fully matured, the Bermuda prisoner revisited the jail, and asked to see the plant. This request granted, he next called for pepper, salt and vinegar, and, to the horror of the good lady, commenced to eat of the supposed poisonous fruit with a relish that astonished the beholders. After enjoying the strange repast, he informed Mrs. K. that the fruit or vegetable was the tomato, or love apple, and it would be found wholesome and nutritious. The seeds of the remaining tomatoes were carefully preserved and distributed among the friends and neighbors of the lady, and thus this popular esculent was introduced into the ancient and goodly borough of York. For many years thereafter it was cultivated as an ornament rather than for table use, but by degrees its merits began to be more fully understood and appreciated, and there, as elsewhere, it grew into general public favor.

PITCHING.

INSTRUCTIONS CONCERNING THE PROPER MANNER OF THROWING A BALL.

Now, a few words in regard to the objects to be aimed at in general practice. First, as regards throwing. Every one has what may be called a natural way of throwing the ball; but this so-called "natural way" usually means a perverted method acquired through carelessness, or attempts to throw too hard before the arm is sufficiently accustomed to the work. As a result of this, there are few boys or college men who may not learn a great deal in the matter of throwing by careful attention for a few weeks to one or two points. The first man to whom attention should be called is the man who takes a hop, skip and jump before he lets the ball go. No man can run fast enough to beat a thrown ball, and, consequently, it takes longer to carry the ball part way, and throw it the rest than it does to throw it all the way. Therefore, the first thing for the man who has acquired this trick to do, is to stand still when he gets the ball, and then throw it. The opposite fault to this is that of leaning away when throwing. A man gets a sharp grounder, and throws the ball before he has recovered his balance, and the force of his throw is thereby greatly diminished. While this is not nearly so common as the other fault, it is quite as difficult to correct. The happy medium between the two is the man who receives the ball and, quietly straightening himself, drives it when leaning forward; and, as it leaves the hand, takes his single step in the direction of his throw. So much for the feet and body, now for the arm, hand, and wrist. The best and most accurate throwers are those who continually practice what is called a "short-arm" throw. To get an idea of the first steps towards the acquisition of this method, let the player take the ball in his hand, and bringing it back just level with his ear, planting both feet firmly, attempt to throw the ball without using the legs or body. At first the throw is awkward and feeble, but constant practice speedily results in moderate speed and peculiar accuracy. After steady practice at this until quite a pace is acquired, the man may be allowed to use his legs and body to increase the speed, still, however, sticking to the straight, forward motion of the hand, wrist, and the arm. The secret of the throw is, of course, keeping the hand in a line with the arm and not swinging it out to the side and away from the head, where much of the accuracy and some of the quickness is lost. Certain catchers have brought this style of throw to such a pitch of perfection as to get the ball away towards second almost on the instant it strikes the hands. They aid the throwing by a slight twist of the body. The quickness of this method of throwing is, of course, due to the fact that there is no delay caused by drawing back the arm past the head, or by turning the body around, which lose so much valuable time. Its accuracy is due to the fact that it is easier to aim at an object with a hand in front of the eyes, than when it is out beyond the shoulder. One can easily ascertain this by comparing the ease of pointing the index finger at any object when the hand is in front of the face, with the difficulty of doing so when the arm is extended out sideways from the body. Still further, in the almost round-arm throwing, which many players use, the hand describes an arc and the ball must be let go at the proper point to go true. If let go at any other point in the swing the throw is certain to be wild. In the other method, that of straight-arm throwing, any variation is far more likely to be a variation in height only, and in that respect the variation may be greater without serious error. A straight-arm throw sends a ball much easier to handle than the side-arm style. The latter is likely to curve, bound irregularly, and be more inconvenient for the baseman. In-field throwing should be on a line as much as possible, and there are few distances to be covered there that require any "up and over" throwing. In getting a ball in from a deep out-field the distance is sometimes so great that none but professionals or exceptionally strong throwers can drive the ball in except by giving it quite an upward direction; even then, however, one should be careful to keep the ball fairly well down, as it is far better to have it reach the catcher on the bound than to go sailing over his head. "Keep it down" is a cardinal rule when fielding to the home plate from the field. If a low ball be thrown, it is easier for the catcher to touch the runner, who, in a tight place will invariably slide as close to the ground as possible. A high throw gives the catcher almost no chance to recover and put the ball on the man, whereas a low throw brings his hands in the most advantageous position for touching the runner. The same is, of course, true in the case of the catcher's throws to the second or the other bases, to put out the runner. The position of the fingers when throwing a ball, is a point upon which there are individual differences of opinion; but the majority of the best throwers in the country use, principally, the forefinger and middle finger in giving direction to the ball.—*St. Nicholas.*

Powerful Machine.—A derrick used by a shipping company at Hamburg can pick up a ten-wheeled locomotive with perfect ease.

Ink Cleanser.—Caustic soda or kerosene oil may be used to clean the hands from printer's ink. The former must be dilute, or it will affect the skin unpleasantly. Other inks yield to oxalic acid, javelle water, etc.

Luminous Paint.—Luminous paint absorbs light during the day and gives it forth at night. The ceiling of an English car painted with the composition lights the vehicle at night. England had the only factory, and charged $3 a pound for the paint, but a new factory in Triesch, Austria, is selling it for 50 cents per pound. It is made of roasted oyster shells and sulphur.

Brains and Dress.—Miss Willard, in a lecture upon woman's dress, made the following interesting statement: Catch Edison and constrict him inside a wasp waistcoat, and be sure you'll get no more inventions; bind a bustle upon Bismarck, and farewell to German unity; coerce Robert Browning into corsets, and you'll have no more epics; put Parnell into petticoats, and home rule is a lost cause.

Projectile Force.—A locomotive working under a pressure of 140 to 165 pounds to the square inch may move a railway train at a velocity of sixty miles per hour, which we are apt to think of as a wonderful speed. But it is slow compared with the rate of motion of the projectile from a modern great gun. Such projectile flies at the rate of 1,365 miles per hour, impelled by a pressure of 35,000 to 40,000 pounds per square inch.

Hemp Silk.—Mr. Nayemura Sakusaburo, a druggist of Hikone, in Omi, Japan, has succeeded in converting wild hemp (yachyo) into a substance possessing all the essential qualities of silk. Nothing is said about the process, but it is asserted that trial of the thread has been made at the first silk-weaving establishment in Kioto and at other factories, with excellent results in every case. The plant in question grows on moors and hillsides. Its fibre is said to be strong and glossy, in no wise inferior to silk when properly prepared. Cultivation on an extended scale would present no difficulties.

EXECUTIVE PRIVILEGES.

WHAT CONSTITUTE THE PRESIDENTIAL AND CONGRESSIONAL PERQUISITES.

All things considered, the office of President of the United States, according to the Washington correspondent of the Boston *Transcript*, is rather bare of perquisites. Probably he has fewer such than any other great ruler in the world. Beyond a few articles in the vegetable way, the nation provides him with very little in addition to his salary of $50,000 a year. He has even to pay out of his own pocket the wages of his cook and maidservants, as well as the hire of his coachman and the price of the fodder for his horses. When he gives a state dinner, which is clearly an official and not a personal affair, he has to pay for the feed. Not only does he not get anything cheaper than other people on account of being President, but he has actually to give more than ordinary folks for whatever he buys. The moment it is known that he desires a pair of horses, the price of the animals jumps 50 per cent. It is the same way with everything. As for horses and carriages, the President must buy his own. It is true that the President does have some things allowed him. He has his dwelling rent free, which means that he is permitted to occupy a few rooms upstairs in an office building called the Executive Mansion. When he gives an entertainment, the rooms wherein he receives his guests are decorated for him in the highest style of the art, with plants and flowers from the great city greenhouses, supplemented by what the White House conservatories are able to supply—all free of tharge. Supposing that the entertainment is a dinner, all the equipments of the table, including the napery, silver, china, glassware, mirrors and other centre-pieces, as well as the floral decorations, are provided gratis. In fact, all such household accoutrements, as well as supplies of linen and furniture of all sorts of requisite, are placed at the President's disposal. When the things wear out, Congress replaces them by appropriation. Only a little while ago $5,000 was paid for a new china set for the President. Although the chief magistrate of the United States has to pay his own cook and chambermaids, a butler and housekeeper are paid by the Government to take care of his dwelling. The butler is a bonded officer known officially as the "steward," whose duty it is to look after the domestic affairs of the establishment. He sees to the heat and lighting—both of them supplied at the nation's expense—and purchases all the provisions for the President's household. The houskeeper superintends all such things as ordinarily come under the supervision of a person acting in that capacity. It is true that the Chief Executive must provide his own horses, carriages and coachman, but one strictly official turn-out is given him, with a groom in addition. Also, there is appropriated each year $8,000 for White House stationery, telegrams, library books, and other contingent expenses. Last but not least, a yacht is placed at the President's disposal by the Navy Department, the United States steamer Dispatch, which is always kept ready for his orders and service. Mr. Cleveland would never make any use of the Dispatch, but no other President has ever entertained any scruples on the subject. Mr. Arthur found the vessel especially available as a pleasure craft. After all, perhaps it would not appear that the President is so very badly off as to perquisites. Cabinet officers have more reason to complain. They have absolutely nothing outside of their salaries of $8,000 a year, save an equipage apiece, and that is only obtained by a very loose construction of the law, which provides two horses and a carriage for each department. It has been customary through many administrations for the Secretaries to use these official equipages for their private purposes. Secretary of Agriculture Rusk, when he was appointed to his present position, for the purpose, as he on one occasion expressed it, of "keeping the flies off the Administration," provided himself, for the department, with the finest pair of horses in Washington and a brand-new carriage of a fashion somewhat out of style, the coachman sitting low down instead of aloft. In this vehicle the ladies of his family make their social rounds. Secretary Noble also has a stunning pair of department horses and the swellest kind of a victoria. Secretary Blaine's carriage is like Mr. Rusk's, only not so new. This is the only Cabinet "perk," and it must be said that the Secretaries are fairly entitled to it, inasmuch as their official situations impose on them certain duties of a social nature which ought not to be permitted to draw from their slender pay. When they want to obtain free gifts of plants, Congressmen are obliged nowadays to apply to the Department of Agriculture. Formerly they used to make requisitions upon the horticultural gardens, but they carried their demands to such excess, some members expecting as many as seven hundred plants annually, enough to stock a small florist's shop, that a law was passed prohibiting the giving away of anything at all from the city greenhouses, though thousands of rose bushes and other things of the sort are thrown out at certain times of the year, and any one can have them for the picking up. Congressmen, however, want them in pots, sent home without charge for expressage. They are apt to get anything of any sort that they want, too, at the departments, owing to the control they can exert over appropriations. Another Congressional perquisite is free telegraph. A majority of the representatives and senators enjoy it. To any member who chooses to apply for it—and in most cases application is promptly made—the Western Union Company sends, as a matter of courtesy, a little book containing one hundred stamps, each one about twice the size of a postage stamp. One of these stamps stuck upon a telegraph blank franks a message and makes it a deadhead. When the book is exhausted, the Congressman sends for another one. Stipulation is made by the company that such free telegrams shall relate exclusively to domestic matters, but there is the best possible reason for believing that the regulation in question is much stretched. Until comparatively recently Congressmen were permitted by law to frank all sorts of packages and things, and they worked the privilege to such an extent that the abuse had to be sat down upon. Barrels, boxes, suits of clothes, everything imaginable, they despatched free in this way. Even now, when they are permitted only to frank public documents and letters on official affairs, the privilege is made to serve illegitimate purposes to a great extent. Free shaves and hair cuts are perquisites of senators, but not of representatives, though why this distinction is made is not easy to find out. As a matter of fact, however, the barbers who operate just off the cloak room of the lower house charge the usual tariff for their services, while at their end of the Capitol the senators pay nothing at all for tonsorial attentions, preferring to support the artists who manipulate razors and scissors about their august heads out of the contingent fund. This is a great economy, reflecting to advantage upon the wisdom of the sages who sit at the feet of Vice-President Morton. It has been thought judicious to encourage the habit of bathing among Congressmen, and with this end in view baths were made free for both House and Senate, it being thought that no member would be likely to resist indulgence in anything that was gratis. Thus it happens that members of the lower house even do not infrequently bathe at the Capitol, where tubs are provided and likewise attendants to rub, draw water and offer towels. Liberal members often give the attendants fifty cents for such services, but it is averred that senators are usually too dignified to offer tips. If there is anything to be paid, the Senate prefers to pay it out of the contingent fund. The House has also a special officer in the person of a chiropodist, who ministers to the afflicted tootsies of representatives free of charge. They may give him something if they like. Each member of Congress has as a perquisite $125 worth of stationery. Formerly "stationery" included such things as mouchoir cases, opera glasses, clocks, brushes and combs, etc., all of which were kept in stock by the big Government stationers' shops at either end of the Capitol building. In those times senators and representatives were accustomed each year to lay in their supplies of Christmas presents from their stationery allowances; but alas! the privileges of the national legislator are being sadly cut down year by year. It is even proposed now to take away his power of directing the appointment of fourth-class postmasters in his district. However, he is still entitled yearly to about one thousand volumes of public books—perhaps six hundred of them agricultural reports—and the latter, at all events, if he is not from an agricultural district, he can sell and does sell to a second-hand dealer or fellow-member at the uniform rate of ten cents apiece. Here is a source of income in itself. Also he receives five thousand small packagss of seeds, for distribution among his constituents. Congress appropriates $100,000 for this purpose each year. Nor would it do to leave out the point about mileage. Each member, by law, gets ten cents for every mile traveled in going one round trip from his home to Washington and back for each Congress. A California Congressman in this way receives a neat little $6,000 extra for each two years of service. Congressmen seldom thought of paying railway fares until the interstate commerce law was passed, and even now they travel largely in the same way, though surreptitiously, as it is supposed. In the Far West it is considered a matter of course that a palace car shall be placed at the disposal of any member going East, with servants, provisions, wines, cigars, and liberty to invite as many friends to go along as he desires. Such packing-boxes as Congressmen care to use are made for them free of charge in the carpenter shop at the Capitol—beautiful pine chests with hinges, and altogether desirable for packing dresses and family goods of all sorts, though it is understood as a matter of form that they are intended for storing away papers and documents exclusively.

FOOD ADULTERATIONS IN OHIO.

THE NEW LAW TO GO INTO OPERATION IN SEPTEMBER.

The people of Ohio are to be congratulated upon the enactment of a pure food law that is sweeping in its scope, and supervises the whole field of food, drink and drugs. Section 3 of the amended law is published herewith, and takes effect in September of the present year, by which time the trade will have arranged to observe its provisions. The term "food," as used in the law, includes all articles of food or drink used by man. Any manufacturer or dealer who refuses to furnish a sample sufficient for analysis to any person interested who tenders the value of the same, or who violates any of the provisions of this act, is liable to a fine and imprisonment.

An act to amend Section 3 of an act entitled "An act to provide against the adulteration of food and drugs," passed March 20, 1884.

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio*, That Section 3 of an act entitled "An act to provide against the adulteration of food and drugs," passed March 20, 1884, be so amended as to read as follows:

SEC. 3. An article shall be deemed to be adulterated within the meaning of this act:

(*a*) In the case of drugs: (1) If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein. (2) If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia, or other standard work on materia medica, it differs materially from the standard of strength, quality or purity laid down in such works. (3) If its strength, quality or purity falls below the professed standard under which it is sold.

(*b*) In the case of food: (1) If any substance or substances have been mixed with it, so as to lower or depreciate, or injuriously affect its quality, strength or

purity. (2) If any inferior or cheaper substance or substances have been substituted wholly or in part for it. (3) If any valuable or necessary constituent or ingredient has been wholly or in part abstracted from it. (4) If it is an imitation of or is sold under the name of another article. (5) If it consists wholly, or in part, of a diseased, decomposed, putrid, infected, tainted or rotten animal or vegetable substance or article, whether manufactured or not—or, in the case of milk, if it is the produce of a diseased animal. (6) If it is colored, coated, polished or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better, or of greater value than it really is. (7) If it contains any added substance or ingredient which is poisonous or injurious to health; provided, that the provisions of this act shall not apply to mixtures or compounds recognized as ordinary articles or ingredients of articles of food, if each and every package sold, or offered for sale, be distinctly labeled as mixtures or compounds, with the name and per cent. of each ingredient therein, and are not injurious to health.

SEC. 2. That said Section 3 of said original act, passed March 20, 1884, be and the same is hereby repealed; and this act shall take effect September, 1890.

THE PIANO-FORTE.

SOME PRACTICAL HINTS ON ITS PROPER CARE.

Our American climate is very severe in its effects upon poorly-made pianos. The great variations in temperature during the different seasons of the year render it impossible for any but the best pianos, made with iron frames, to remain uninjured. The most delicate parts of the piano necessarily being made of wood, the fittings and joints of which are adjusted with the greatest nicety, extreme heat or dampness is very detrimental to their well being. The mercury should not be allowed, if possible, to rise above seventy-five degrees, nor to fall below forty, in the room in which the piano is kept. The piano should not be placed where the hot air from a heater, stove, or grate is thrown against it. Care should be taken to place the instrument where its entire surface will be subjected, as nearly as possible, to the same degree of temperature, as nothing will so soon put a piano out of tune as being kept with one end cool and the other warm, as is frequently the case when an instrument is placed between the hot air from a heater and the cold air which in winter is falling within one or two feet from the windows. A sudden change of twenty degrees in temperature will put the best piano slightly out of tune. A change of temperature, therefore, in a heated house should be gradual. Dampness is more to be feared in summer than winter. Do not place the piano near open windows, and be particularly careful that the instrument is closed at night.—*The Opera.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

July.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, egg-plant, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb, corn, beets.

FRUITS.—Cherries, strawberries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple.

PRACTICAL RECIPES.

CHICKEN SOUP.—Take the broth in which a chicken has been cooked and to each quart put a cup of fine hominy while it is boiling. Let this boil for half an hour or until the hominy is thoroughly done, then season with pepper and salt and serve.

CHOW-CHOW WITH OLIVE OIL.—One-quarter peck green tomatoes, one large head cabbage, eight onions, three dozens small onions, twelve cucumbers. Cut all in not very small pieces, except the small onions, and pack in salt over night. Pour off the salt water and put all to soak in weak vinegar and water for two days. Drain dry and add half a pint grated horse radish, one-quarter pound of white mustard seed, one quarter ounce of celery seed, four tablespoonfuls of black pepper, two and a half tablespoonfuls of tumeric, one small box of mustard, one pound of sugar. Mix all together with three quarts vinegar. Let the whole boil and when nearly done add a half cup of olive oil.

EGGS AND TOMATOES.—Skin three tomatoes, cut them in half and put them in a porcelain lined frying-pan with butter, pepper and salt; beat up together eight eggs and three teaspoonfuls of cream, and pour them into a saucepan in which two teaspoonfuls of butter have been melted. Stir without ceasing for a few moments, then add the tomatoes. They will cook quickly, then pour them on small slices of toast and serve immediately.

COCOANUT PUDDING.—Four yellows, one pint cocoanut, one teacupful of butter; make a meringue of whites, use milk of cocoanut, bake in paste.

STRAWBERRY SHORTCAKE.—Make a five-egg cupcake, beating well so that it may be fine grained, and bake in a square-pan so that it will be about four inches thick when done. Cut into three layers. Take one quart fine strawberries, bruise them slightly, make them very sweet with powdered sugar and let them stand for two or three hours. Spread this mixture on the cake layers, put them together. Beat to a very stiff froth, with a silver fork, one pint sweet cream. Heap over the top of the cake and serve.

ANGEL'S FOOD—A DESSERT.—Dissolve half a box of gelatine in one quart milk, beat together the yolks of three eggs, one cupful of sugar and juice of lemon; stir it into the gelatine and milk and let come to a boil; flavor with vanilla. When nearly cold beat whites stiff and stir through custard. Pour into molds and cool.

LIVER CROQUETTES.—Boil half a pound of calf's liver till nearly done, mince it very fine. Season highly with pepper, salt, chopped parsley, onions and sage or sweet herbs. Mix well with a beaten egg; shape into croquettes, dip in egg and bread crumbs and fry in boiling lard.

SUNSTROKE.

The constancy of the bodily temperature under all circumstances of external heat and cold—of torrid and arctic zones, of summer and winter, of sunshine and darkness—is not the least remarkable instance in nature of a self-adapting mechanism. The average internal heat of the human body or of the blood is from 98 to 99 deg. Fahr., and the healthy range in different individuals, or in the same individual at different periods of life, or in various circumstances of exercise and repose, sleeping and waking, is not more than a degree or two below or above the mean. It will be at once apparent that the sensations of heat and cold are no measure of the bodily temperature. The mechanism by which the body's heat is kept uniform is a co-operation of a number of agencies. It is an equation of which the two sides are the amount of heat produced in the organism and the amount of heat dissipated. In hibernating mammals the former of these is the side to which adaptation is most directed, in such wise that the whole fires of the animal burn lower while the winter cold lasts. But in man the work and waste go on always, and therefore the heat of combustion is practically uniform at all times, so that the adaptation to seasonal and climatic changes of temperature is mainly on the other side of the equation, the regulation of the amount of heat given off from the body. In cold weather the amount of bodily heat parted with is limited by warm clothing (or clothing which conducts heat with difficulty) by keeping up the temperature of the air artificially by fires, and by the contraction of the surface vessels and other muscular structures in the skin, which has the effect of diminishing the insensible perspiration and makes the familiar sensation of cold. While these adaptations to external cold air are decidedly the greatest, it is not to be supposed that there are no adaptations on the other side of the account. There is, in fact, an increased production of animal heat also, so that more can be parted with, and the constant temperature of 98.5 deg. be still unaffected. The increased production is often in the way of increased muscular exercise, which every one is prone to in cold weather; it is to some extent also through the more active circulation in all the internal organs, especially brain and liver, their greater functional activity being attended with a larger amount of the heat of metabolic combustion. A heat-forming diet of carbohydrates (chiefly fats), and the physical benefit of the subcutaneous fat resulting therefrom, are well-known elements of the adaptation in colder latitudes. When it comes to be an adaptation to great solar heat, the adaptation is again mostly in the way of regulating the heat lost. The vessels of the skin are dilated and its other muscular elements (in the sweat-glands, etc.) relaxed (making the familiar sensation of heat), so that perspiration flows freely; the evaporation of the sweat on the surface of the body is constantly consuming heat, and the clothing is worn light and of such color and texture as will readily conduct heat (both of radiation and of evaporation). There is now as much effort to part with the body's heat as in winter there was effort to retain it. At the same time the heat of combustion in the body is kept down as much as possible; muscular exertion is avoided, the brain and the digestive functions are less active, and fatty substances are partaken of more sparingly. The various parts of this conservative adaptation are somehow co-ordinated through the central nervous system. The vascular is obviously a chief means by which the body's heat is kept constant, not only by the quick transit of the blood to all parts, and the free mixture and interchange of its particles, but also by the control of the amount of blood sent to the skin on the one hand (say, in warm weather), and to the muscles and viscera on the other (say, in cold weather.) The vaso-motor nervous mechanism therefore, is an integral part of the nervous control of the bodily temperature. But there is reason to think that the regulation of the bodily heat is committed to the charge of a still higher and more commanding centre in the nervous system than the vaso. It is a remarkable fact, observed from time to time in clinical practice, that certain cases of injury to the brain, from fracture of the skull or internal hæmorrhage, are attended with a quite phenomenal rise of the body temperature—a rise to 107 or 108 deg. Fahr. and that too, when there is nothing strikingly unusual in the vaso-motor effects, as revealed in the skin or elsewhere. In such cases it is the surface-region of the pons varolii, the great cerebellar commissure, that has been injured or compressed by the effusion and coagulation of blood. The evidence of specially devised experiments confirms and amplifies the clinical evidence; and it is considered in physiology to be a well-grounded fact that there are thermic or heat-regulating centres in the brain, one, at least, being in the region of the pons varolii. Bernard would further assume the existence of "calorific" and "frigarific" nerves side by side with vaso-dilator, and vaso-constrictor. Such then being the nicely-balanced and carefully safe-guarded mechanism

for keeping man's internal heat about 98 deg. Fahr, under all circumstances. Undoubtedly the heat-apoplexy, heat-stroke or sunstroke, is the direct result of an upset or disintegration of the heat regulating nerve-centre. Either the disorder of ennervation is shown in sudden syncope or depression of the heart's action, as among laborers working, or soldiers marching in the sun; or the effect of atmospheric heat, direct, solar or other, is an universal state of venous engorgement, indicating profound vaso-motor paralysis, and ending in death from asphyxia, literally, the "livid death" alluded to in the couplet; or the heat-stroke leads to an attack of thermic or "ardent" fever, coming on perhaps in the night, within a few hours of exposure, or after a longer interval, having a prodromal stage of malaise, a rise of the body heat to as much as 108 or 110 degs. Fahr., embarrassments of the lungs and heart, profound brain-troubles, and probably a fatal termination in general venous engorgement and asphyxia. These various forms of heat-stroke all point to a profound disorganization of the nervous centres by the more or less direct action of solar heat, to cardiac depression in the syncopal form, to more general vaso-motor paralysis in the asphyxial form, and to disorganization of the thermic nerve-mechanism in the hyperpyrexial form. When recovery takes place, as it does in a large proportion of cases, there are often lasting traces of injury to the nervous system in other functions than the vaso-motor or thermogenic. Knowing therefore, the cause of sunstroke, the means of preventation are within our reach. Violent exercise even is not so dangerous as allowing the system to get out of order. When each organ in the system performs its proper functions, there is not much danger to be apprehended even in the hottest climate, under a tropical sun. The best way to keep the organs at their functions is in the judicious use of Ayer's Cathartic Pills, and Ayer's Sarsaparilla. These two well-known remedies have such an established reputation that every one is familiar with them and therefore only need this reminder.

BUSINESS NOTES.

THE OPERA PIANO.

We have had considerable to say about piano-fortes lately, which we hope has been of value to our readers. What has been said was in general terms, and it is therefore timely now to refer specially to one individual firm. It is that of the manufacturers of the Opera Piano, Messrs. Peck & Son, 212 to 216 West 47th Street, New York. This house has constantly endeavored to make the best instrument that can be made of good materials and by skilled workmen, combining all that is necessary and desirable to produce a first-class piano, without needless adding to the expense of production by anything that is more for show or fancy than for practical use. The result has been the Opera piano. This piano has been made for more than twenty years, strictly first-class in material and workmanship, with unvarying success. The Opera piano, besides being in beauty, fullness and singing quality of tone, the excellence of its interior workmanship and its artistic finish, all that could be desired, is fitted with a tone muffler pedal, that will be found valuable alike to parties using it for practising as well as to skilled performers in the production of beautiful effects; the makers have also added a handsome removable "bric-a-brac" cabinet, which greatly enhances the splendid appearance of the piano at very small extra expense. A variety of styles are made in these popular instruments, all of which are illustrated in the firm's catalogue, and they also issue a book of testimonials from which an excellent idea of the estimation in which the "Opera" Piano is held by competent authorities and delighted players may be obtained.

THE VICTOR BALING PRESS.

For the benefit of the numerous hayshippers among our readers, we desire to call their attention to the advertisement of George Ertel & Co., of Quincy, Ill. This firm has been manufacturing these presses for twenty-four years and are the largest Exclusive Baling Press manufacturers in the United States and Canada. Thousands of these presses are in use throughout the civilized world. They are guaranteed as represented and prices are lower than those of others, while the quality is unsurpassed. All who are thinking of buying a press would do well to write to Messrs. Ertel for a catalogue which gives full description besides much other useful information.

COLDEN'S LIQUID BEEF TONIC.

MARINE HOSPITAL, PORT OF BALTIMORE,
Jan. 16, 1875.

Dear Sir: In compliance with your request to give my opinion of "Colden's Liquid Beef Tonic," I take pleasure in recommending it as a most excellent stimulant, tonic and invigorator of the system, which can be used whenever a stimulant and tonic combined is not contra-indicated. I have tested it in many cases since its introduction into our market, with universal success.

Very respectfully yours, etc.,

WM. F. STEUART, M. D.

AMERICAN ANALYST

A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

FOOD ADULTERATION.

At the annual meeting this year of the Washington Chemical Society Mr. Richards the retiring president delivered an interesting and instructive address on the subject of food adulteration in this country. His purpose was to explain how in some instances adulteration is possible without involving risk of deleterious consequences. The fact is that from want of reliable information in regard to the materials employed in most new food products, there is a general feeling of uncertainty and insecurity on the subject. People, as a rule, imagine that any substance used as an adulterant of, or a substitute for, a food product is to be avoided as itself being injurious to health; and when they hear that a certain food is adulterated, or is a food substitute, there is immediately a prejudice excited against the article, which it takes time and familiarity to allay. A moment's reflection ought to show that it would be directly contrary to the food manufacturer's interest to add to, or substitute anything for, a food product which would cause injurious symptoms, as in that case his means of gain would be cut off by the refusal of consumers to buy his product. It is true that the unscrupulous manufacturer or dealer does not hesitate to cheat his customer in the interest of his own pecuniary profit and gain, but he does not want to poison him. Where, through carelessness or ignorance injurious substances, such as the arsenic, copper, aniline, and other metallic and organic poisonous salts sometimes used for artificial colors, are added to foods, their presence is promptly revealed by the dangerous symptoms which they call forth in the consumer. The use of flours and starches of various kinds as food adulterants cannot be considered injurious to health. However much the public may be cheated in the purchase of such adulterated articles they are not poisoned by them. Moreover, it is a question how much a purchaser is himself to blame, in his endeavor to secure a "bargain," when he demands so great a quantity of any given material at less than it can be purchased at wholesale in the market, that he compels the unscrupulous manufacturer to make a compound which has never more and generally less than the proportion of the genuine material represented by the price asked. Many articles of food spoil in transportation; and, under the plea of preventing further fermentation, resort is had to antiseptics, such as salicylic acid, sulphite of soda, borax, etc. These deserve mention as being additions to foods of a class of substances used to cloak carelessness in manufacture and otherwise, and producing in many cases deleterious effects on the human economy. In France and Germany the use of such antiseptics as salicylic acid in food products is prohibited, although in the latter country such addition is tolerated when the food product is exported to countries where such use is not prohibited.

RUSTICUS IN URBE.

Our always wide awake daily contemporary, the *Sun*, called attention lately to the specially desirable opportunities afforded country residents for securing fine furnished apartments in this city during the summer months at a merely nominal expense. It did not add, as it might well have done, that New York City is probably the most delightful summer watering place in America. What with cooling sea breezes, street cars traversing the thoroughfares in every direction, comfortable and well-aired concert rooms and theatres to while away the hours between dinner and bedtime, incessant steamboat communication with the innumerable seaside resorts located within an hour of the city, and a multitude of other attractions, the summer visitor to New York has infinite satisfaction at his command of a much higher order than can be hoped for at any imaginable out of town place, whether fashionable or secluded. Outside of the stated and stately yearly summer movements of our so-called Society, the New Yorker does not usually leave his residence during the heated term in the serious hope of securing increased physical comfort in the country. Crowded hotels, stuffy bandbox apartments, unsatisfactory food, perfunctory attendance and extravagant charges are poor substitutes at any time for home comforts in the city. But all these inconveniences are patiently encountered, year after year, for the sake of securing for self or family the change of air and the variety of surroundings, which experience has demonstrated to be beneficial and often indispensable to the work-worn city resident. Thus it is that the comfortable house or flat is closed, and then it is that the provincial visitor to New York has his opportunity. There are, as the *Sun* says, thousands of flats in this city which can be had for a song during the summer months. Their occupants are obliged to go into the country about the 15th of June, and the flat is left furnished and in perfectly habitable condition. During their absence the lessees are obliged to pay rent, and any money they receive for the apartment is a clear gain. Hence very low terms can be made. The writer cites in illustration a flat in one of the most fashionable apartment houses in this city, the rental of which unfurnished is $150 a month. Over $7,000 worth of furniture has been placed there. A gentleman from Cincinnati who came on with his wife to establish a New York branch of his business, and had set aside three months for the purpose of doing the preliminary work before the fall season opened, secured the flat fully furnished with table and bed linen, silverware and all the rest, for $75 a month on a three-months' lease. Cheaper flats can be had at proportionately low rentals. It is far better than boarding, and undoubtedly the coolest way of spending the summer in New York, for the flats in the big apartment houses are nearly all so thoroughly ventilated that their occupants do not suffer from the heat.

A NEW TEXTILE.

The London *Daily News* says that an apparently well authenticated report describes the discovery of a plant which, if it possess all the qualities attributed to it, threatens to become a powerful rival of jute. To what special genus the plant belongs is not stated; but M. Brackenburg, a chemist, who discovered it growing abundantly on the shores of the Caspian, has given it the name of "Kanoff." The plant posseses a splendid fibre, soft and elastic, with a glossy, satin-like texture. It is strong and pliable, and can be dyed without injury. M. Brackenburg believes that from its marvelous abundance and consequent cheapness, and its extraordinary durability, "Kanoff" will successfully compete with any other textile for sacking, ropes and pack thread. The fibre has a greater resistance than hemp, and its specific gravity is less.

ADULTERATIONS IN NEW JERSEY.

THE STATE COMMISSIONER'S REPORT FOR 1889.

Over in New Jersey the State Dairy Commissioner has been compelled to issue a report without being allowed to read the proof-sheets, owing to some obstructive printer with a "pull," setting himself up as a law unto himself. The consequence is that throughout the pamphlet the singular and plural of analyses are inextricably mixed, ammonia is printed armour, cicid stands for acid, aliumma for alumina, tyrotoxicon is spelled with an "a" and disuse is printed disease. These are fair average specimens of this New Jersey printer's blunders. But the value of the information contained in the report more than makes up for these shortcomings. The law relating to oleomargarine has been strictly enforced, and a most thorough system of milk inspection has been carried out throughout the State. During the year 2,507 analyses of food have been made of which more than 45 per cent. was found to be adulterated. Not to make the law bear too hard upon innocent dealers, notice was given in every instance of the result of the analyses and prosecution threatened if future analyses should find adulteration. Of 1,072 drugs analyzed about 65 per cent. were found adulterated or below the legal standard. Of these various articles those which gave the highest percentage of adulteration or not standard, the percentage of each were as follows:

	PER CENT.
Oleomargarine	57
Imported canned goods	88
Ground coffee	80
Spices	45
Extracted honey	74
Maple syrup	50
Vinegar	64
Pickles	73
Baking powder	81
Sausage	all
Dried apples	all
Jellies and jams	76

The chief adulterant found in these articles was copper, which was added to give a green color to the vegetables. The following names were on the labels of the adulterated samples:

Luneville, Guillanmz.	A. Dupin.
Barton Fils.	Alex. Eygueme.
F. Roudenet & Cie.	Gabriel Triat & Co.
Dandicolle & Gandin	Vie Garres & Fils.
Petits Pois (no packer).	Talbot Freres.
R. Moubadon.	Eugene Du Raix.
S. Nicholas & Cie	Eugene Mercier.
G. Talbot.	Alphonse Pinard.
E. Dufour & Cie.	Goulean.
Gillard Fills.	Chs. Julien.
Duprat, Clement & Mauriel.	A. Marcy & Cie.
J. Fiton Aine & Cie.	Bouvais, Flou.
A. Dufour & Cie.	Henri Lambert.
L. A. Price.	Rodel & Fils.
Briant.	Rilhac.
Henri Lambere & Cie.	Lemoule.
J. Nouville.	Victor Leopold.

Piere Durand.

It is with pride that we can add that all the American canned goods examined were found free from metals and other dangerous ingredients Of the condensed milk examined, the most condensed was Howell's and the least the Highland brand. Most of the adulterated coffee came from Philadelphia. This was also the case with spices. The prepared cocoanut examined consisted of ground cocoanut with 42 per cent. of cane sugar added. Considering the price at which this is sold, it shows a large profit for the manufacturers. The sausages examined contained poisonous coloring, unclean casings, and a nasty varnish sold to unscrupulous butchers under the name of "smokine" or liquid smoke. Every case of meat poisoning which was reported as having occurred in the State during the year was carefully investigated. Not one, and this statement deserves to be considered, was due to canned meats, but all to decayed butcher's corned beef. Dried fruits were found contaminated with zinc from having been dried on galvanized metallic frames. In jellies and jams the adulterations consisted in the use of aniline dyes for color and the addition of starch and Japanese isinglass to give body. In many cases the body of the jellies was apple pomace artificially colored and flavored.

CAMPHOR.

HOW THE WORLD IS SUPPLIED BY JAPAN.

The following particulars regarding the preparation of Japan camphor are furnished by a firm of exporters of Japanese products at Hiogo: The camphor forests in Southern Japan are divided into two categories, which furnish the bulk of the world's camphor supplies. In the first category are the forests which are the property of the Government, and kept under the strict supervision of the Forest Department. They contain a considerable number of trees, but as far as the supply of camphor is concerned, these forests can only be counted on to a limited extent. At the discretion of the authorities, permits are given at irregular intervals to cut down old trees in certain districts, and the production of the government forests depends on the relative liberality with which permits are issued. On the average, government forests furnish about one-fifth of the total quantity exported, and cannot be depended on as a regular source of supplies. On the other hand, the forests or trees belonging to private individuals are the base of the supply of the trade That a considerable decrease of these camphor trees has taken place is beyond doubt. The provinces of Tosa and Satsuma, in former years the only source of supply, are very nearly exhausted; but in distant parts, beyond the mountains and remote from water, camphor trees are still to be found. This is of importance, as the present high price of camphor on the spot is further enhanced by transportation through pathless regions before water, for the distillation of the gum, can be reached. The production has under these circumstances, and in spite of the abnormally high prices now ruling, not experienced any material increase. At the same time it must be stated that there is now proceeding an extension of the distilling area over new districts, *i. e.*, in provinces comparatively bare of trees, and which up to now gave no camphor. These facts confirm the view that, however high prices may go, the average supplies will not only not experience any essential increase, but, on the contrary, become less and less in future years. The camphor tree, like the oak, grows very slowly, and it takes several hundred years before the full size has been attained. There is therefore no chance for the present generation to derive any benefit from the trees now in course of being planted. The present prices stimulate the production to the utmost, and the fresh gum is being hurried on the market. The opinion that native speculators store the camphor in order to raise prices is totally wrong. The largest yield of gum from the trees is obtained during the cold season; first, on account of the sap or essential oil contained in the tree then being concentrated in the big roots and the lower part of the stem, and, secondly, as the distillation can be done more efficiently by using cold water. This process is performed in a most primitive way on the banks of the nearest brook, as follows: A hearth or circular wall of stones is constructed, five to ten feet high; on this is placed an iron pan, and thereon a tub about three feet high, the perforated bottom of which rests on the pan. Then the tub is wrapped up in a layer of clay, into which the roots and stem wood, cut into small chips, are placed. Water is now poured into the pan, the cover of the tub closed air-tight by clay, and fire kindled on the hearth. The steam rising from the pan pervades the chips and extracts from them the essential oil, leading it through a bamboo tube into the refrigerator, which consists of two wooden boxes, through the larger one of which, having no cover, a continuous stream of water is flowing, while the smaller one, being without a bottom, is placed on the water in the larger box, and serves as an air-tight receptacle for the steam saturated with the essential oil, which after the lapse of twelve hours, is thoroughly extracted from the chips. In the meanwhile camphor and camphor oil have deposited on the inside of the smaller box above the water. They are scraped off, and, by pressing them, the camphor crystals and oil are separated. The camphor thus obtained is in a very wet condition, and loses up to 30 per cent. more of oil and water until it is put on board a vessel. The camphor oil is valuable, and carefully collected to be refined, thus yielding more camphor, while the refined oil is sold for exportation as camphor oil. Hiogo is by far the most important place in Japan for the exportation of camphor, but the gum is extensively dealt in at Nagasaki also, chiefly for the wants of Hong Kong. There are no available returns for this latter port, and it is probable that its trade is gradually more or less being absorbed by Hiogo. The apparent scarcity of camphor in Satsuma and the southern provinces generally accounts for this fact, while the distilling area has extended further north, *i. e.*, into closer proximity to Hiogo. It should also be borne in mind that the camphor which is now shipped loses about five per cent. more weight during the voyage than formerly, when the cargo was delivered by the natives in a drier condition.

SPIDERS AND THEIR HABITS.

SOME INTERESTING FACTS CONCERNING VENOMOUS SPIDERS.

It does not seem to be generally known that spiders are provided with a poison of a very active nature, the effects of which are similar to those produced by snake poisons. It is true that many spiders are small and quite harmless to man; but it is probable that some poisonous fluid is secreted in the mandibles of all spiders. Even the bite of the common house spider is quickly fatal to flies and other insects on which it preys, Spider poison appears to have special effects on certain insects, and the largest flies are not often the least affected by it. Insects over which spider poison has but little influence are usually left meshed in the web to struggle until exhausted before the spider attempts to devour them. When a fly is bitten by a spider its whole body seems seized by violent convulsive twitchings, and death generally occurs after a few minutes. The spider's poison issues from a sac and duct at the base of its mandibles. It closely resembles the venomous matter secreted by scorpions, and is a transparent fluid, containing traces of formic acid and albumen. There seems to be nothing characteristic in its microscopic appearance. When it is collected from the poison glands of several spiders and dried, it will retain its physiological properties for many years, and even after it has been subjected to a boiling temperature its properties are not destroyed. The spider is provided with a most effective apparatus for injecting its poison, consisting of modified mandibles, called falces, the last joint of which has a hard, curved fang, with a fissure near the point. The muscles used in closing the mandibles also press upon the poison gland, causing the poison to be expelled through the fissure into the wound, and thence into the circulation of the victim.

The reader should watch a common house spider spin its web. It seems to take pains, before beginning, to select a spot where there are chances of obtaining plunder, and where it will be secure. It then discharges a little drop of glutinous fluid, and creeps up the wall, joining the thread from one wall to the other. The first thread thus formed is drown tight, and fixed at each

end with other threads. It is upon this outer thread that the durability of the whole fabric depends. The web's foundation completed, the spider next makes a number of threads parallel to the first, and then crosses them with other threads, the sticky substance of which they are formed serving to bind them, when newly made, to each other. It now commences to double and treble the threads that border its web, securing the edges as it does so. Lastly, it forms a kind of tunnel with its webbing. This is to serve as a retreat, where it can conceal itself from its enemies and also from its prey, and is generally placed in the angle of the walls. When the spider's work is done, it often happens that the approach of some large animal or the passage of the housemaid's broom will destroy in a minute the labor of days. In this case, as soon as the danger is passed away, the spider patiently begins to repair the web. For this purpose the spider is provided with a store of the glutinous matter of which the web is made. When possible, the spider prefers the mending business, as it is only provided with a limited quantity of glutinous matter, and when this is exhausted it probably cannot be renewed. Old spiders, which have neither web nor the materials to make one, often hunt about to find out the webs of other spiders, younger and weaker than themselves, with whom they venture battle. The invader generally succeeds, and the younger spider is driven out to make a new web, and the old spider remains in possession until a stronger spider invades the web and drives it out. When thus dispossessed the spider seldom ventures another attack, but tries to subsist upon the few insects that may fall accidentally into its clutches, and eventually dies of hunger. The well-known tarantula is one of the largest, but by no means the most venomous species of spiders. It belongs to the mining section of the family termed *Lycosidæ* or wolf spiders, and attains a length of three-quarters of an inch. The tarantula's body is covered all over with down, chiefly of an olive dusky-brown color. The upper border of the thorax and the outline of the eyes are yellow, and the back of the abdomen is marked with a row of triangular dark spots with whitish edges. Their eight eyes are arranged in three transverse rows, the front row containing four small eyes, while behind there are two pairs of larger eyes. During the summer months the tarantula, while creeping among the corn, bites people employed in the fields, but the bite, though painful, is seldom dangerous. Dr. Zangrilli, an Italian naturalist, who has had many opportunities of observing people bitten by the spider, says that soon after the occurrence the part bitten becomes deadened, and in a few hours there are slight convulsive shiverings, cramps of the muscles, spasms of the muscles of the throat, followed by vomiting and a three days' fever. Recovery generally follows after copious perspiration, but in one case there was tetanus and death on the fourth day. The tarantula is common in Europe in Spain, Southern France and Italy, occurring in great numbers in Apulia round the town of Taranto. It has been found in Asia, and also in Northern Africa. The tarantula is to be found in dry places, partly overgrown with grass, and fully exposed to the heat of the sun, living in an underground passage which it digs for itself, lining it with its web. These passages are round in section, and sometimes quite an inch in diameter, often extending to the depth of a foot or even more below the surface. This spider is very quick in its movements, and eager in the pursuit of its prey. It waits only to kill one victim before it darts upon another, and it has been known to allow itself to be carried into the air by a large fly that it has attacked rather than relinquish its hold. The female tarantula lays from nine hundred to a thousand eggs in a season, and shows considerable maternal care. When the number of eggs she has brought forth have remained for an hour or two to dry after exclusion, she prepares to make a bag for them. For this purpose she spins a web and lines the inside with down which she plucks from her breast. Within the bag, which is almost as thick as paper, the eggs are deposited, and it is then fastened, by means of the glutinous fluid she secretes, to the end of her body. The female tarantula has never been known to abandon her offspring until they are able to take care of themselves. She hatches two broods in the year, in spring and autumn, and has been known to hatch three. The eggs are not adherent to each other in the cocoon. When the young ones are excluded from their shells within the cocoon, they remain in this confinement until the female, instinctively knowing their maturity, bites open the bag and sets them free. The young of web-making spiders, after leaving the egg, immediately commence weaving, but the young tarantula (leading a vagrant life and having no web), being incapable of protecting themselves, remain for about a fortnight with the mother, giving rise formerly to a belief that they derived their nourishment from her body.

SUNSTROKE.

SOME PRACTICAL RULES FOR ITS AVOIDANCE AND RELIEF.

It is the easiest thing in the world to avoid sunstroke or heat prostration during the warm, humid days, if you will only exercise a little care and judgment and observe a few very simple rules. In the first place wear the very lightest flannels and the airiest clothing in your wardrobe, and don't be in a hurry. Persons of an excitable temperament are more liable to sunstroke than those of a more phlegmatic disposition, So it is with those who have heart trouble, and it is well for them to bear in mind that it is exceedingly dangerous for them to be affected by the heat. Sunstroke causes a change in the blood by robbing it of its power to take up oxygen, which, as everybody knows, is the very essential of life. Soon the blood becomes saturated with carbonic acid, and unless this is quickly removed, death must ensue. With the heart function already interfered with, no matter how slightly, heat stroke, as it is more properly designated, becomes a very serious matter. The same is so in the case of stout people, who, as a rule, are more liable to suffer from the heat than others. Some care should be exercised in the character and quantity of food and drink taken. It is not by any means necessary to change one's mode of living, but at the same time heavy, heat-giving articles of food, that take a long time to digest, if not altogether abjured ought at least to be partaken of sparingly. This certainly does not inflict a hardship upon anybody, for in nine cases out of ten the craving for oils, fats and such articles of food is entirely absent in the summer time, and simply because the system does not require them. In short, don't eat a Christmas dinner on the Fourth of July. Much misery and suffering may be avoided by learning to drink slowly. As the skin is apt to act freely, it is necessary to keep the body supplied with liquid. Most people are possessed of the erroneous idea that the sensation of thirst is located somewhere in the stomach, and hence it is that they keep on drinking until they can hold no more. The work of throwing off this unnecessary quantity of liquid falls upon the skin and other glands, which are apt to become paralyzed in their action as soon as the slightest tendency to heat prostration manifests itself. Bear in mind that thirst is located in the throat, directly behind the tongue. This can be demonstrated by anybody who will go to the trouble of sipping a glass of water instead of gulping it down. In this way it will soon become apparent that half a glass of water will as effectually quench thirst as half a dozen glasses, and, what is more, without producing that sensation of fullness which is so annoying on a warm day. Once having learned how to drink judiciously, half the danger from heat prostration is overcome. Cooling drinks should be freely partaken of in the way above indicated, but bear in mind that suddenly chilling the blood with very cold, iced fluids is an extremely hazardous proceeding. Have the water and other drinks moderately cold, and besides being safer to take they also become more palatable. By paying but trifling attention to these rules, sleep on a warm night becomes natural, and this alone is half the safeguard against heat prostration, for there is nothing so invigorating and refreshing as a good night's rest. Now a word about how to assist a person who has been prostrated by the heat when a doctor is not near at hand. The very first thing to do is to remove the sufferer to a shady spot and loosen all the clothing. To get rid of the carbonic acid in the blood keep the limbs in motion, not violently, and thus induce freer respiration. A tendency, however slight, to returning consciousness is always a hopeful sign, for it indicates that the brain is receiving a supply of healthy blood. Apply cold cloths to the head and along the back of the neck. Sometimes, when the patient's hair is very thick, it is well to shave off part of it and place the cloths directly in contact with the scalp. If the feet are cold apply hot bricks and administer stimulants, such as brandy and water, in small quantities at frequent intervals. This is about all that can be done in the first stage of prostration, and it will generally suffice, for by this time the doctor will be on hand to take care of the secondary symptoms of heat-stroke.

BANTING HUMBUGS.

THE MARKET FLOODED WITH ANTI-FAT FRAUDS.

"The number of nostrums for the reduction of obesity which have been put upon the market during the past two months," said the manager of an upper Broadway drug store, "is almost without limit. Here, for instance, are four remedies, all designed for this particular ailment, and every one of them has been turned into our hands for sale within the month." He placed two bottles, a pill box and a tin can full of powders in a row upon the showcase. They were all encased in neat wrappers, and every one of them had a name which suggested corpulency, but did not use the word fat. "All these remedies," said the old druggist quietly, "are claimed to be made of special ingredients, but they are nothing more than Epsom salts in one form or the other. We never recommend them, but we have to keep them on sale owing to the steadily increasing demand for all medicine of this sort. It is not that they are especially deleterious. They simply have the same weakening effect that Epsom salts have if taken every day for a month or two. Naturally they reduce the weight, but the flesh comes right on again as soon as the salts are stopped. You can imagine the prices the public pay for these things when you reflect that our profit on this bottle of stuff is 60 cents. It is sold for $1, and I have no doubt in the world that the manufacturer clears 30 cents on every bottle."—*Sun.*

A Queer Notion.—A curious survival from the Middle Ages was put into practice at Guernsey lately to stop the public auction of household goods, which was disapproved of by the eldest son of the family. The formula uttered by the son is as follows: "Haro! Haro! Haro! A l'aide, mon Prince! On me fait tort!" The sale ceased instantly, and the matter will now come before the Royal Courts in due course.—*Notes and Queries.*

Golden Magnesium.—M. N. Warren finds that when the metal magnesium is heated in a current of ammonia thoroughly dry, and keeping the temperature below a red heat, it combines with the gas without changing much in appearance, though its chemical properties are much modified; for instance, it will not melt below a bright red heat, and burns, when red hot, with violent decrepidations or small explosions. If the current of ammonia is continued, and the metal in this form heated to bright redness, it is gradually converted into an orange yellow substance which is permanent. This new product dissolves in acids, and the solution contains ammonia. When fragments of magnesium which have been kept at a dull red heat for some time come in contact with gaseous ammonia, it often happens that their surface becomes dark yellow and shines like gold. The exact nature of this golden magnesium has not yet been made out.

CLIMATIC CHANGES.

CAUSES OF THE PHENOMENA OF STORMS AND COLD WAVES.

In our last issue we published a brief statement of the grounds upon which Sergeant Dunn, in charge of the U. S. Signal Service office in this city, bases his theory that the climate of this latitude is gradually changing. His speculations on the causes of the possible change are curious and interesting. He said in his lecture: "Within the past year or so most storms have traveled across the country north of this city, and have followed each other in such rapid succession that it was only on rare occasions that an area of high pressure with a cold wave could slip down from the Northwest and overspread this part of the country. In 1889, and January and February, 1890, only one storm centre passed south, which is one factor in accounting for a scarcity of cold weather. These months embrace twenty-eight well-defined storm centres which passed north, each in turn causing a steady flow of warm air from the South over the central valleys and this section. In former years, while a majority of the storms passed north, the interval of time between their passage was longer, and they were generally followed by an area of high pressure which extended over a great part of the country, and their severity was partly spent before reaching the coast. The number of storms that passed off the coast south of New York averaged about one-third the number that passed north of the city. Each of the former drew a cold wave directly over the city. In my research I found that many of the storms originated in the great interior plateau of the Rocky Mountains. These invariably passed over the irrigated lands of Colorado or Wyoming, and sometimes Nebraska and Kansas. Storms from the northwest and southwest, with few exceptions, took the same course across some of the States mentioned where irrigation existed. Some appeared to be drawn hundreds of miles out of their natural course into the irrigated section. In 1888 sixty-two storms passed directly over or into the irrigated region; in 1889 there were sixty-seven. All storms, like electric currents, follow a path of the least atmospheric resistance. An increase of moisture offers extra attraction. The immense area of country surrounding the irrigated lands offers resistance to a storm movement in its dryness. In my opinion, further change in our climate depends entirely upon irrigation. If lands in the Northwest are first reclaimed, the effect would be to have a continuance of storm tracts over the higher latitudes. On the other hand, should lands in the Southwest be first reclaimed, the storms would take their first course and a greater number would pass south of New York, thus drawing down upon the city cold waves, as in previous years."

OBSTRUCTIVE RABBITS.

THE DIFFICULTY OF ABATING THE AUSTRALASIAN RABBIT PEST.

Consul Griffin, from Sidney, N. S. W., reports a total expenditure in that colony of $3,868,000 by the Government in the last six years, and of about $1,000,000 more by the "pastoralists" for the extinction of the rabbits. The subsidy paid in many cases exceeded the rent of the holdings. Wire fencing is in great demand, at a cost of $400 a mile. Skillful capturers of rabbits earn from $20 to $48 per week, and are paid by the scalp. Landholders are compelled by law to employ these hunters. In one year, New South Wales exported 15,000,000 skins. The number of rabbits is estimated at hundreds of millions. Their increase is something frightful. The multitudes of rabbits in Australasia had their origin in a single pair imported for sporting purposes, and liberated near Geelong. They are very destructive to trees, grass and other crops. Poison with phosphorized grain has been tried; other poisons also. These endanger poultry and live stock, and must be used with caution. The mongoose and ferrets were introduced as natural enemies of the rabbit. In New Zealand, whose export of rabbit skins was 60,000,000 in six years, the ferret is quite in favor; but the ferret soon turned his attention to poultry and small birds, and has nearly exterminated the race of Maori hens. Traps and such devices have proved to be a delusion. They caught ferrets and rabbits without distinction. The reward of $120,000 offered by the Government of New South Wales for the best riddance from the rabbit pest brought in 1,500 schemes; 115 of them to kill by disease, such as catarrh, small-pox, hydrophobia, etc. The inocculation scheme of M. Pasteur was experimented with very carefully, but not successfully. Rabbits were inoculated with the microbes of chicken cholera; but the Commission that made the experiment decided that the Pasteur plan would introduce a disease not now existant in Australasia, and which has everywhere proved disastrous to fowls, and which has not been known to prevail naturally among rabbits. In the Island of Jamaica, where the mongoose and the ferret were introduced to extinguish the rabbits, these creatures turned their attention to domestic fowls and to the forest and orchard birds. With the destruction of the birds came an alarming increase of insect life, and the wood and field ticks have made life a burden to man and beast.

PURE FOOD.

AN EARNEST PLEA FOR A NATIONAL PURE FOOD LAW.

In a report presented to accompany the Pure Food bill recently reported from the Senate Committee on Agriculture and Forestry, Chairman Paddock says: If the United States is disposed to interpose to prevent, as this committee thinks it should, the damage to health and morals which these practices of dishonest dealers are working in every community, it seems desirable that the information already gained, and the experience acquired in the Department of Agriculture should be utilized. As the enforcement of the law will depend very largely upon scientific investigations, it was felt by the committee that the officers connected with it should be from a distinctively scientific department. Another reason equally as strong, presented itself as an argument for placing the execution of the law under the direction of the Department of Agriculture. By far the greater part of the articles of food consumption, which would be affected beneficially by the proposed legislation, are the products of American farmers. Declining prices and restricted markets, the results of the sophistication of foods after they have passed from his hands, withdrawal of the confidence of consumers, which is affecting alike the reputation of the producer and the product, all have combined to arouse the American farmer to the necessity of such legislation as will supplement the imperfect, and consequently ineffective legislation of the States. It is estimated by a leading trade journal of the United States, that 2 per cent. of the entire food product of the country is sophisticated. Taking the estimate of $4,500,000,000 as the total value of the food supply, consumed in the United States annually, there is upon this basis of estimation $90,000,000 a year of fraudulent food products foisted upon consumers. Grabboth, of the Massachusetts Board of Health, asserts that in that State, as the result of the stringent food and drug inspection laws, there has been a saving of 5 per cent. to the people in the increased purchase of food products. If the same results of deterrent legislature could prevail throughout the country, the annual saving to the consumer, through pure food would reach the stupendous sum of a quarter of a billion dollars. But there is another standpoint less vital from which the importance of the subject presents itself. This is from the side of the food producers, whose products are sophisticated and misbranded because of the suspicion of fraud which discredits the purity of the products subject to adulteration. Both houses of Congress have been deluged with petitions from the farmer's organizations during the present session, praying for legislation which will compel the manufacturers of hog products to conform to the laws of commercial honesty. They complain, and justly, that the sale of compounded products under the name of the genuine article, is destroying a remunerative market for their hogs, by displacing millions of pounds of pure lard with articles of a cheaper quality, sold under the same name. While eminent chemists are not agreed that the lard compounds are deleterious to health, there can be no dissent from the view that such articles should be sold under their rightful names, and marketed as compounds and not as the simple products which they simulate. The farmers of the country who see their products lessened in value every year by millions through sophistication and misbranding, and their tables assailed in turn with fraudulent manufactured food products, have every reason to complain that they are robbed at every turn of the wheel. In conclusion the report says: The bill reported by your committee is believed to be at once conservative and comprehensive. It is drawn, in their judgment, alike in the interests of the honest manufacturer and the general consuming public. It will render unnecessary the enactments of laws, directed against special interests or designed to supplement trade jealousy. By its passage, adulteration and sophistication in foods and drugs will, it is believed, be reduced to the minimum, commercial integrity bulwarked by the detection and punishment of dishonest dealers, and millions of dollars annually saved, now abstracted from the pockets of consumers. Supplemented, as it should be by legislation, dealing with the inspection of products of the slaughterhouses intended for foreign sale, it will strengthen and build up a declining export trade in American food products, and materially lighten the load now carried by the American farmer.

STANLEY'S PYGMIES.

A RACE WHOSE PEDIGREE REACHES BACK TO PREHISTORIC TIME.

In his recent address in London, before the Royal Geograhphical Society, Mr. Stanley gave an interesting account of the pygmies, inhabiting the great forest through which he travelled, who were known to exist by the Father of Poets, nine centuries before the beginning of the Christian era. "Nearly a year ago we found them where they had been located by tradition under the names of Wataa and Wambutti. We were just now paying due reverence to the kings of the forest, who were born before the foundations of the tower on Shinar plain were laid, and because it seemed to us that in their life they united prehistoric times to this society, journal-loving nineteenth century. Let us pause a little and pay honor to those little people, who have outlived the proud Pharaohs of Egypt, the chosen people of Palestine, and the emperors of Babylon, Nineveh, Persia, and the Macedonian and Roman empires. They have actually been able to hold their lands for over fifty centuries. I have lately seen the wear and tear on the Pyramids of Egypt, and I can certify that the old Sphinx presents a very battered appearance indeed, but the pygmies appeared to me as bright, as fresh, and as young as the generation which Homer sang about. You will, therefore, understand that I, who have always professed to love humanity, in preference to beetles, was as much interested in these small creatures as Henry Irving might be in the personnel of the Lyceum. Near a place called Avetiko, on the Ituri River, our hungry men found the first male and female of the pygmies squatted in the midst of a wild Eden, peeling plaintains. You can imagine what a shock it was to the poor little creatures at finding themselves suddenly surrounded by gigantic Soudanese, six feet four inches in height, nearly

double their own height and weight, and black as coal. But my Zanzibaris, always more tender hearted than Soudanese, prevented the clubbed rifle and cutlasses from extinguishing their lives there and then, and brought them to me as prizes, in the same spirit as they would have brought a big hawk, moth, or mammoth longicorn, for inspection. As they stood trembling before me I named the little man Adam, and the miniature woman Eve, far more appropriate names in the wild Eden on the Ituri, than the Vukukuru and Akiokwa which they gave us. As I looked at them and thought how these represented the oldest people on the globe, my admiration would have gone to greater lengths than scoffing cynics would have expected. Poor Greekish heroes and Jewish patriarchs, how their glory paled before the ancient ancestry of these manikins! Had Adam known how to assume a tragic pose, how fitly he might have said: 'Yea, you may well look on us, for we are the only people living on the face of the earth who, from primeval time, have never been removed from their homes. Before Yusuf and Mesu were ever heard of, we lived in these wild shades, from the Nile Fountains to the Sea of Darkness, and, like the giants of the forest, we dispise time and fate.' But, poor little things, they said nothing of the kind. They did not know they were heirs of such proud and unequalled heritage. On the contrary, their faces said clearly enough, as they furtively looked at one and the other of us, 'Where have these big people come from? Will they eat us?' The height of the man was four feet, that of the woman a little less. He may have weighed about eighty-five pounds; the color of the body was that of a half-baked brick, and a light brown fell stood out very clearly. So far as natural intelligence was concerned, within his limited experience, he was certainly superior to any black man in our camp. The mysteries of woodcraft, for instance, he knew better than any of us, he knew what wild fruits were wholesome and what fungi were poisonous. He could have given us valuable lessons how to find our way through the forest. I saw also that he could adapt himself to circumstances. Our foragers and scouts may have captured about fifty of these dwarfs, only one of whom reached the height of 54 inches. They varied from 39 inches to 50 inches generally. A forest village consists of from twenty to one hundred families of pygmies, and probably in that area between the Ihuru and Ituri rivers, there are as many as two thousand families, living this nomadic and free life in the perpetual twilight of the great and umbrageous forest of equatorial Africa."

THIOKETONE.

THE WORST SMELLING SUBSTANCE KNOWN.

An amusing instance of the inconveniences of carrying on chemical research in populated districts (*Brit. and Col. Drug.*) appears incidentally in a paper on Thioderivatives of Ketone, by E. Baumann and Fromm. By the reaction of sulphureted hydrogen on acetone in the presence of condensation agents, they obtained principally trithio-acetone $C_9H_{18}S_3$, and small quantities of a non-volatile, definitely crystalline compound $C_{15}H_{28}S_4$, tetrathiopeuton. At the same time, however, an exceedingly volatile body was formed which possessed a smell so horrible that, in comparison therewith, ethylmercaptan, ethylenmercaptan, and other volatile sulphides must be considered as faint-smelling substances. The authors could not obtain the compound pure (for a reason which they mention further on), but there could be no doubt that it was the monosulphureted acetone C_3H_6S or thioketone. As they were once distilling the reaction product of 100 gr. acetone, concentrated hydrochloric acid, and sulphureted hydrogen, with the most perfect arrangements for condensation, so that no perceptible loss of the product occurred, the atmosphere of the surrounding district of the town was infected over an area more than 800 yards wide! Every attempt to obtain the substance pure brought down such a storm of protest and complaint against the laboratory that the authors were compelled to relinquish the research.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

July.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, egg-plant, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb, corn, beets.

FRUITS.—Cherries, strawberries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple.

PRACTICAL RECIPES.

EGGS IN DRAWN BUTTER.—Boil eight eggs for twenty minutes; take from the water, remove the shells, cut them in slices about a quarter of an inch thick; make a pint of drawn butter, put the eggs in it, cook for a moment and serve. This is a nice breakfast dish.

SOUFFLE OF PEAS.—Heat thoroughly half a can of French peas with pepper, salt, and a few tablespoonfuls of cream; beat up four eggs, yolks and whites separately, and to the yolks add the peas and cream; add the whites, stir well, put in a buttered baking dish, and bake for five minutes in a brisk oven.

KIDNEY PIE.—Parboil three or four mutton kidneys, slice them very thin; line a pie dish with good paste, fry slightly some slices of bacon, put a couple of slices of it on the crust, then a layer of kidney, seasoned with pepper, salt, and a little finely-minced onion, a couple more slices of bacon; then kidney as before, then an upper crust and bake.

STRAWBERRY ICE CREAM.—Pick one quart berries and mash them through a sieve; add to the juice two large cupfuls of sugar; make a custard with one pint milk, two eggs, one-half-spoon butter; vanilla and sugar enough to make very sweet; set aside to cool; when cold add it to the berry juice and freeze.

STRAWBERRY BAVARIAN CREAM.—Soak one-half a box or one ounce gelatine for an hour in one-half cup of cold water; whip stiff one pint sweet cream; pick one quart strawberries and mash them through a fine sieve, sweeten thoroughly; put the gelatine over hot water to dissolve; to it add the berry juice, and with an egg beater, whip until cold; then add the whipped cream and pour into molds to stiffen. This may be eaten with or without whipped cream.

FRIED CHICKEN WITH CREAM GRAVY.—Cut up the chicken and wipe it dry, roll the pieces in flour, season, and fry in boiling lard; turn frequently, and when well done lay them in a hot dish; into the pan then put one tablespoonful butter, and when it is melted one of flour; cook for a minute, then add a teacupful of milk and pepper, salt and minced parsley; let it boil up and pour over the chicken.

GREEN PEA FRITTERS.—Mash one pint hot boiled peas through a colander; add one tablespoonful butter, and pepper and salt; when cool add two well-beaten egg yolks, a cup of cream and one and one-half cupfuls of flour, in which two teaspoonfuls of baking powder have been sifted; stir and heat thoroughly; lastly, beat in the whites of the eggs and fry in boiling lard.

PULQUE.

A MEXICAN BEVERAGE DISTILLED FROM THE AGAVE PLANT.

Pulque is the national drink of the Mexicans, and is the product of the American agave (century plant). This mild liquor could be made in California, where the agave reaches great perfection, but the intensity of its odor is too great for American endurance, and would certainly bring our country into disrepute among strangers. The leaves of the agave, after the sap has been extracted, are rotted and made into coarse ropes and materials of different sorts. The agave is called by the Mexicans "Maguey," and the headquarters for its culture is near the City of Mexico, where most of the liquid product is sold. The plants are grown in fields of from five to fifteen acres in extent. The rows are placed at a distance of about twenty feet apart, and the plants at from ten to twelve feet in the rows. The plantations are made from the root suckers, which spring up around the base of the old plants. The liquor cannot be extracted until the flower stem is developed, which is ten or twelve years after planting. This stem while yet in the bud is cut off and a cavity or basin scraped out which holds about two quarts. Every morning the sap is removed from this cup and is emptied into pig skins, where it is allowed to fervent. The result is a mild, intoxicating drink, considered by the natives of the most agreeable flavor. It is quite nutritious, and after awhile many foreigners are said to become fond of it. It is consumed by every class of people in the nation, but seldom to excess. Mules can be seen making their way to the cities from every direction with two pig skins slung over their back, seemingly there being a continuous string of them nearly all the year around. The pulque has to the unaccustomed nostril a most villainous odor, and creates within one, vile suspicions and prejudices, which only time and experience can remove. A plant will yield from two and a half to four dollars' worth of pulque, the price per gallon being less than twenty-five cents. This pulque is also distilled into spirits, which resemble that obtained from grain, which is called by the Mexican "Aguardiente." As soon as the sap has all been secured from the plants, the leaves wither up and are ready for rotting into fibre. It is said that the variegated agave furnishes a better and more costly fibre than the ordinary green variety. Plants of average size will yield from two and a half to three dollars' worth of fibre, so that the total product of an acre of agaves, allowing 170 plants to the acre, would amount to about $900; but it must be remembered that this is the result of from ten to thirteen years of cultivation, during which time the plantations have to be kept free from weeds by the plow and hoe and the multitudinous suckers removed. The raising of "Maguay" plants is considered by the Mexicans one of their most profitable industries.—*California Fruit Grower.*

OMNIPRESENT BACILLI.

ACTION OF THE SOIL ON PATHOGENIC GERMS.

Pathogenic germs evidently exist in the soil. The bacilli of tetanus, typhus, and cholera have been observed, and it is probable that the bacillus of tuberculosis, the pneumo-coccus, will be found. The superficial strata of the earth are extremely rich in pathogenic germs. At a certain depth there is a limit beyond which the number of germs rapidly diminishes, until they cease altogether. In the deep strata of the bacilliferous zone, pathogenic species do not exist. Grancher and Deschamps have observed the arrest of the typhus bacillus at a depth of fifty centimeters. In the cultivated superficial strata there are fewer micrococci than bacilli. The bacilli exist in the soil chiefly as spores. Under this form they best resist destructive agents, and may remain latent for years, retaining their virulence. It is probable that the pathogenic bacilli germinate in the

soil. The cholera bacilli form numerous colonies at a depth of three metres during the months from August to October; from April to June, at a depth of two metres there is no development, while at a depth of 1.50 metres the bacillus vegetates. At least two per cent. of humidity is necessary for the development of the germs. Soil rich in organic material is most favorable to this development. Causes of death of the pathogenic germs exist in the soil. The principal cause is exsiccation. Koch and Duclaux have demonstrated that this is especially hurtful to the micrococci, and here, according to Koch, is the explanation of the fact that micrococci are relatively rare on the superficies of the soil. The cholera bacillus dies rapidly under exsiccations. Netter fixes three weeks as the extreme limit at which the exsiccated pneumo-coccus preserves its virulence. The two most potent causes of destruction which the microbes encounter are the saprophytic bacilli and solar light. The saprophytic bacilli are in continual strife with the pathogenic microbes, and have generally the advantage. The bacillus of tetanus is exceptional, and may develop favorably in the presence of other species. Solar light is injurious to very many bacilli. According to Duclaux, it is the most universal means of sanitation, and the most economical and potent to which public or private hygiene can have recourse. The turning up of the soil liberates pathogenic germs, but when the soil is not disturbed for a long time, a colossal germination frequently goes on. Exhumation frees the bacteria long latent in the soil. Hence the epidemics that follow the turning up of the ground. Pathogenic germs leave the earth in many ways to attack men and animals. The soil which adheres to the body, to the feet of animals, and that which is carried by insects disseminates pathogenic germs. Currents of air transport superficial dust, and so propagate the spores which resist exsiccation. Water also carries germs. Ordinarily, subterranean waters are on a level with the bacteriological zone. Sometime this zone is exposed by fissures or by openings made in the earth. The walls of a well are a prolongation of the superficies, and are favorable to the life of the germs.—*The Sanitary News.*

WATERPROOF PAPER.—Paper or pasteboard may be rendered waterproof as follows: Mix four parts of slacked lime with three parts of skimmed milk, and add a little alum; then give the material two successive coatings of the mixture with a brush, and let it dry.

HAIR PRESERVER.—It is stated that one grain of philocarpine in a half ounce of vaseline appplied to the scalp will prevent baldness.—*Gaillard's Medical Journal.*

AN INFANT INDUSTRY.—A statistical crank computes that about 37,000,000 babies are born every year, and that their cradles placed in line would reach round the globe. Here is an infant industry that has never been fostered a cent's worth by a protective tariff, yet where is there another that is greater and more prosperous.

WATER COURSES.—The purchaser of land on which is a spring acquires as to the spring the rights of a riparian owner only. He can use it for any necessary and proper purpose incident to the land itself and essential to its enjoyment, but cannot divert the flow of it on the land of another for any purposes without answering in damages.

EXPENSIVE CLOCK.—Thirty thousand pounds for a clock has just been paid by one of the Rothschilds. The clock was a beautiful specimen of the Louis XV. period, which had been given as a wedding present to the Countess Fitzwilliam many generations ago, and had been kept as an heirloom at one of the family seats, Milton Hall, Northamptonshire.

DEEP MINE.—One of the deepest coal mines in the world is at St. Andre du Poirier, France, and yearly produces 300,000 tons of coal. The mine is worked with two shafts, one 2,952 feet deep and the other 3,088. The latter shaft is now being deepened, and will soon reach the 4,000 feet level. The remarkable feature in this deep mine is the comparative low temperature experienced, which seldom rises above 75 degs. Fahr.

WHAT BECOMES OF IT?—A correspondent writes: "It is a well-known law that energy is indestructible, but a case came to my notice a short time ago in which it is hard to tell in what form the energy appears. A metal spring is placed under tension, and while in this state is fastened and placed in acid until it is completely dissolved. What becomes of the energy stored up in the spring? Is it turned into heat, and if so, how?" Perhaps some of our readers will give their views in reply to this interesting query.—*Scientific American.*

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CONTENTS.

PURE FOOD IN CONGRESS.

It is daily growing more evident that there is little chance that any bill dealing with food adulteration will become a law at this session of Congress. One or two measures may pass the House, but the Senate has so much work ahead that it will hardly have time to consider them. The investigation in the Senate and House Committees has proceeded along somewhat different lines. The Senate committee has considered the general subject of food adulteration, and the House committee has confined itself thus far to the one subject of adulterated lard. Some of the advocates of general legislation insist that it will cover lard as well as other compounds, but the advocates of the lard bill say that their bill will be more effective in its specific object, and that it is much better to enact it than to scatter fire all over the subject. It is possible that the bill authorizing the States to exercise police powers in regard to articles offered for sale within their limits will have a bearing on the subject of food legislation. This is the bill called originally "the Original Package bill," but which has been extended by the amendments of the House committee to other articles than intoxicating liquors. It is doubtful if the Senate finds time to act upon the Pure Food bill at this session. The bill has been carefully prepared, however, after consultation with the representatives of different industries, and it may get through at the short session next winter. In the House the members of the Committee on Agriculture mean to insist on one or two days for the consideration of their measures, and they expect to get them. The Conger bill, placing a tax of one mill per pound on compound lard, will probably be taken up first and debated at length. It was the intention a few weeks ago to give precedence to the Butterworth bill, aimed at futures and options, but the enthusiasm upon that subject seems to have cooled. The Conger bill will encounter opposition from the lard manufacturing centres, from the Southern States which produce cottonseed oil, and from Democratic members who believe that the taxing power of the Government should not be diverted to accomplish specific results. But all these influences together are not likely to prove much more potent than they were against the Oleomargarine bill, which was much more outrageous in degree if not in character than the Lard bill. If the Lard bill fails to pass, it is more likely to be because there is less interest in its passage than there was for the Oleomargarine bill, rather than because of the real strength of the opposition. If the bill can be carried through the House at this session, it will stand a fair chance of passage in the Senate next winter.

HOW TO SLAUGHTER THE MICROBES.

William Radam has recently published a book entitled "Microbes and the Microbe-killer." The book reviews the germ theory of disease exhaustively, detailing the long series of experiments made by Mr. Radam and others. It shows the value of the new remedies in destroying the microbes of disease, and clears away some of the mysteries with which medicine has so long heen enshrouded. The style is simplicity itself, and the book is therefore invaluable in the home and family, as well as of interest to the general reader.

Under the caption given by us the *N. Y. Tribune* inserts the foregoing paid advertisement in its editorial columns, without mark or sign that would indicate to the reader the true character of the paragraph. The *Tribune*, entirely forgetful of its dignity as a journal, of its character for truthfulness and reliability, and of the theories of its former editor, Charles A. Dana, which the *N. Y. Herald* deems of such great value as to adopt them as its motto at the head of its editorial page every day, allows itself to be bought for a trifling sum to endorse an article that has been exposed time and again, and which every sensible person can instantly recognize as one of the vilest nostrums. In fact the *Tribune* does worse than this, for it not only endorses a vile nostrum, but by recommending a so-called book "on Microbes and the Microbe-killer," admits that some one in the editorial rooms of that paper has read this nonsensical compendium of an ignorant charlatan's cries to a gullible crowd. It needs but a cursory glance at any page of this "book" to prove to any well balanced mind that the man who wrote it is as ignorant of medicine and pharmacy as indeed he himself admits. Then why does the *Tribune* so far forget its duty to its readers as to publish such an endorsement. In order to satisfy anyone who may not at the time have seen our exposure of Radam and his nostrum that we are not too severe, we will quote the following paragraph, which has been recently going the rounds of the press: "Radam's Microbe Killer is recommended to kill and rid from the human system all disease-producing germs. According to Dr. R. G. Eccle's analysis, given in the *Druggists' Circular*, it is composed of "oil of vitriol, impure, 4 drams; muriatic acid, impure, 1 dram; red wine, about 1 ounce; well or spring water, 1 gallon. This concoction is sold for three dollars per gallon, less than five cents being required in its manufacture." Such a combination of ingredients may kill the microbes, but what about the effect on the person taking the terrible dose? It reminds one of the tame monkey that was guarding his master while sleeping. When a fly alighted upon the forehead of the object of his tender care, he picked up a stone and threw it, intending to kill the fly, but alas! crushed his master's skull, thus killing both at one stroke.

COAL WASTE.

A commission has been appointed by the Legislature of Pennsylvania to investigate and report upon the coal waste in that coal-producing State. In order to render the result of their investigation as comprehensive and conclusive as possible, they have divided their work into three branches, each with several subdivisions. As the subject is of great importance in an economic view, its purpose being not only to diminish so far as practicable the present great waste of coal, but also to encourage the utilization of what are now waste products, we present herewith the scope of the pending inquiry. Any reader of the American Analyst who has any suggestions or valuable facts bearing on the subject will render a great service by communicating them to the Commission through the Hon. J. A. Price, chairman, at Scranton, Pa. The divisions are as follows:

1. Geological and Statistical Waste.—Estimate of the original geological coal field and waste of erosion. Estimate of existing coal field before coal mining began. Estimate of amount worked to the present year. Estimate of the total amount that it is possible to take from the earth by any known system of mining, giving the amount that must be left in the ground in shape of pillars, etc., or what may be regarded as permanent structural waste. 2. Waste of Producing and Marketing.—Investigation of the underground waste of mining. In-

vestigation of the waste of preparation, including all processes in which the commercial size has been continually reduced, the amount of culm in sight at place of preparation, and the annual product of culm. Investigation of the marketing of the pea, buckwheat, bird's-eye or rice, and dust, and the uses to which the several sizes or conditions are put. 3. Utilization of Coal Waste.—Examination of the whole Briquette system, duly-recorded tests under responsible supervision, patent office records, specimen forms and chemical analyses. Accumulation of the record of all the practical mechanical appliances by which the waste is utilized without mechanical preparation, such as devices of furnaces, grates, blowers, etc., etc. Investigation of the use of waste after mechanical preparation for combustion, as in pulverized conditions, etc., etc. Examination of the gassifying processes into water-and-producer-gas, also in the destruction of garbage or cremating work, also in agricultural experimentation.

LARD AND CAUSTIC SODA.

George Ludlow, twenty-three years old, an employe in Wilcox & Co.'s lard manufactory at Guttenburg, N. J., fell into a vat of caustic soda yesterday. His cries of agony attracted Frank Yaers, another employe, who, in attempting to rescue Ludlow, also fell into the vat. The cries of both men brought a number of workmen to the vat. Ludlow and Yaers were rescued after they had been in the vat about five minutes. It is thought both men will die.—*Tribune.*

As there is but one legitimate use for caustic soda in lard refining—that for cleansing, and as a vatful cannot be needed—it follows that caustic soda in this factory must have been employed for bleaching the lard. The consequence of this would be to add a weighty and harmful adulterant. A pertinent query is, How much caustic soda is left in the finished lard to make weight, save labor and expense of washing it out, and make the lard injurious to health?

A DANCING PROCESSION.

A SINGULAR ANNUAL RELIGIOUS FESTIVAL.

Writing from Brussels, under the date of June 3, a correspondent of the *Tribune* says: "While the Passion Play is going on at Obergammergau, there has been going on in the Grand Duchy of Luxemburg the annual dancing procession of Saint Willibrord. It occurred at the small town of Echsternach on the 27th of May, the Tuesday after Whitsuntide. Saint Willibrord, who lived in the seventh century, was to the Netherlands, Flemish and Lower Countries what Saint Patrick was to Ireland. He carried the Christian faith to those regions, civilized them as much as it was possible in those barbarous times, and finally sought rest for his last days at Echsternach, where he founded an abbey. The legend says that when the saint died the marble tomb prepared for receiving his body was found to be too short; but that it was miraculously lengthened so that the saintly corpse could be laid in it. Tradition claims that when Saint Willibrord returned at last from his holy pilgrimage to Echsternach the villagers could not restrain their joy, and demonstrated it by the sacred dances, which are renewed every year, two days after Whitsuntide. Only during the French revolution was the custom interrupted. It is now more than ever kept up, and 20,000 people took part in the latest ceremony. The peasants believe in the legend according to which the saint punishes the indifferent and incredulous by afflicting their cattle with epidemic, the effects of which are like epilepsy. The pilgrims arrive from all places within a radius of forty miles. Most of them come on foot, camping wherever they can, in open air or in barns. All among them who possess and can play upon musical instruments bring them along, such as fifes, drums, cornet, etc., and play on them as an accompaniment to the dance. In the morning all this crowd forms itself on the German territory, beyond the bridge which crosses the Sure, the river frontier between the Grand Duchy and Germany. A priest, who must have been born at Echsternach, addresses the crowd, places himself at its head, and the pilgrims begin to tramp on the bridge, in the direction of the old church. The advance guard, preceded by a sexton dressed in red clerical robes, sings the praises or litanies of Saint Willibrord in a calm, dignified, religious voice, which strangely contrasts with the clamors of the thousand instruments which accompany the extraordinary dances of the people forming the bulk of the procession. Those dances are nothing but repeated jumps, and the highest jumps are considered the greatest evidence of devotion. The pilgrims advance slowly in rows, blocking up entirely the streets, women holding children in their arms, old people being supported on both sides by friendly assistants, peasants with satchels on their backs, containing provisions to last during the pilgrimage. All these people never cease for a moment to dance, or rather to jump as high as they can, until they reach the old church, where the priests bless the many articles they want to place under Saint Willibrord's invocation. The pilgrims spend the remainder of the day in the streets of Echsternach, where a regular fete, somewhat like a Flemish Kermesse, is held. They then take up again their tramp to their homes."

THE MODERN PIANO.

THE PROCESS OF CASTING PIANO PLATES.

Many owners of pianos are not only affectionate admirers of these pleasure-giving instruments, but are also curious about their mechanism, and will open the lid, as the small boy opened his pet dog's mouth, "as wide as possible so as to see its works." One of the questions with which such people ply the periodic tuner, or their music dealer, or the piano teacher, will certainly relate to the iron frame on which the metallic chords are strung to vibrate the melodies of Mendelssohn or Chopin. The piano frame is as important to the piano as the keel timbers are to a ship. Strength, balance, soundness, finish, lightness, must all be present in it, and it is obvious that a piano cannot be a good one without a good plate. There is an extensive plant in Connecticut devoted especially to the manufacture of piano plates and brackets for holding the action. The amount of detail in piano manufacture has indeed caused such a subdivision in the processes of manufacture that there is only one large piano firm in the country which casts its own plates. There is, besides the domestic demand, a considerable export trade for plates. It need not be added that the tariff has encouraged this industry materially, as it does all manufactures of iron. The piano plate factory in Connecticut is situated at the water's edge on an inlet of Long Island Sound, and if one approaches from that direction the visitor will immediately observe the prime requisites of the business—coke and iron being unloaded from a steam lighter, a vessel that also transports the plates to this city. The best quality of iron, of different kinds combined, enters into the plate, the few dollars of extra cost for the best material not being worth considering in a work demanding the highest perfection. About fifteen tons of iron are melted each day in the furnace. Near to the furnace is a small building in which the beginnings of the plate are to be seen in many valuable wooden models, carefully cut to suit the requirements of different makes of pianos. These wooden models are used to secure a casting for the iron pattern; and the latter, when perfected, is used to make all the impressions in the moulds for plates of that form. This particular firm has made an innovation by preparing the wooden models themselves, so that makers have only to send their drawings and specifications in order to receive plates to suit them. On entering the foundry one sees long rows of dingy boxes on the floor, each being about eight feet square and filled with sand. There are 130 men employed at the works, counting the day and night-force. It is in the morning that one sees the deft preparation of the moulds. The sand is moistened and trodden to the proper consistency, carefully smoothed, and then the iron pattern is pressed into the yielding bed. The impression secured is still further perfected by an expert workman, who touches up rough portions with delicate tools, using all the care and skill of a sculptor or modeler in clay. He moistens his tools with his breath, and keeps patiently smoothing and patting the sand until his critical eye is satisfied. The mould being declared perfect, top and bottom, known as the "knowl" and the "cope," are joined, accurately secured by corner pins, and a half-dozen apertures left in the sand in which to pour the melted iron. A light sprinkling of powdered graphite, or black lead, is used as a coating to the mould to make the sand separate easily from the casting. The afternoon brings a weird scene, when the moulds, being all closed and ready, the dusky foundry is enlivened by gangs of men hurrying with pots of melted iron from where it runs in a fiery stream from the furnace retort to the long rows of waiting moulds. Each gang of six men takes six moulds to fill. A foreman directs the movements, and all begin to pour and all stop at the word of command. Meanwhile, from the apertures in the moulds jets of gas spring into the air, and these, lighted with a white-hot rod by a young son of Vulcan, add to the fascinating lights and glooms of the interior. The casting remains in the sand about five hours, being weighted to prevent warping or straining. Night brings another force of men, who open the moulds and put the plates in a connecting room to cool. From here they are taken in hand by men who carefully chip off, file, sandpaper and brush away all inequalities, and pass the plates on to the drillers. A piano plate contains several hundred holes, and these must be bored with exactness to hold the tuning pins, wire pegs, framing pins, etc. A pattern is clamped to the frame, and the centre for each hole stamped through the pattern on the plate. The latter is now started on a journey across the room, and one size of hole is drilled in it at each table where it stops. The plate rests on a revolving table and this on a platform that slides or rolls either way, enabling the operator to bring the exact spot under the drill. The latter is brought down by a cord affixed to the boot-heel of the operator, who looks as if he were being served like an unruly cow doing penance for jumping. The drills are energetic little machines, and eat through the casting in a few seconds. The plates are now divided. Those intended for the New York City trade and the West go out at one door and direct to the city salesrooms to be finished. The ones for the region north and east of the Harlem are finished at the factory. The first process is japanning, a liberal coating of the sticky fluid being applied, when the plates are piled in enormous brick ovens and heated

to 400 deg. Fahr. to give the hard, dry surface desired. Pumice stone perfects this process, and now the plates are more or less gilded or bronzed and receive a final coat of varnish. Some are highly decorated by hand with delicate tracery in colors. Just before shipping a boy hammers in the small pins over which the ends of the wires are fastened. The contrast of the pig iron in the yard and the smooth, artistic, harp-like plate, with all its musical possibilities, is a striking one. The designs are themselves handsome; the curved arms and braces, an interlinking network, while designed only to secure strength, lightness and resonance, have by some correspondence of law also developed a design of beauty, which is heightened by the decoration. The plates weigh, on an average, about 200 pounds each, yet the strain of the piano wires when tightened runs up into many thousands of pounds. The firm sends its castings occasionally to the Stevens Institute to be tested, and, while ordinary cast-iron has a tensile strength of about 21,000 to 22,000 pounds per square inch, the metal of the plates has tested up to 27,000 and 28,000 pounds. While so-called steel plates are used by one or two firms, a skilled metallurgist and practical moulder expresses doubt as to whether more than a handful of steel finds its way into the melting pot—just enough to give the name. A sound, well-designed iron frame, such as described, meets the wants of almost all manufacturers at present. The Chickerings were the first to develop the idea of whole cast plates, but until the last thirty years they were not used greatly, as thinner wire and less severe strain in stringing were used in the old-time pianos. Especially since the upright piano has become popular in recent years, the making of whole plates has grown greatly in importance. Skilled students have worked over the problems of resonance, resistance, the composition of the iron, etc., until the business has become one of itself, whereas it used to be a side issue in foundries devoted primarily to other casting. The other metal fittings of the piano, brackets, etc., are cast, nickel-plated and polished in a small extension of the foundry mentioned. The whole area of the buildings is about four acres, the street frontage being 675 feet, while every operation is conducted on the ground floor. The foundry was erected for this special purpose, and the furnace being placed outside the main building gives a cool room for casting. The pig iron starts at one end and comes out a finished plate at the other, and there is no waste of time and labor in moving or hoisting. The operators work by contract or piece, each man taking the plate from the next man under him, and are all as busy as bees in a system that looks the perfection of economical production. The number of firms to which the plates go is surprising. Cast on the plates are not only the names of well-known New York piano-makers, but manufacturers in Canada, the Far West, Europe or Australia.—*Tribune.*

VITALITY.

SOME REFLECTIONS UPON THE INSOLUBLE MYSTERY CALLED LIFE.

The greatest of all mysteries is that of the true nature of Life, or the principle of vitality. Without going to abstruse philosophical reasonings, the fact ofthe actual existense of life must be an admitted fact, even if the question of the subjectivity or objectivity of what we call matter and energy is left undecided. The writer or the reader of these lines must necessarily be sure of his own existence—that is, the existence of perceptive faculties, although the certainty of the actual existence of anything else may be unprovable. We are unable to separate our intelligence from ourselves; and although it is a fanciful, and perhaps illogical speculation, yet the idea that all the surrounding universe has no real existence, but is only the "baseless fabric of a vision," and that *I*—the *ego*—am the universe, must have occurred, at times, to every thoughtful person. Practically, however, we must base our actions upon the existence of an outside world, and the more we can bring ourselves into harmony with the conditions which environ us, the greater happiness and satisfaction we shall obtain. Pain and pleasure are realities; and to avoid the one and attain the other in the highest degree is the "chief end of man"—actually at least, notwithstanding the doctrines of the "shorter Catechism." A newly-laid egg is, apparently, nothing but a mass of albumen, with a few other complex organic chemical compounds; but the miraculous changes which occur when it is submitted to a gentle heat for a few weeks, show that this mass of albumen is wonderfully different from the simple organic substance known by that name. The little microscopical cell or germinal vesicle in the yoke possesses the power of setting up a rearrangement of the molecules of the material of the egg, which results in the formation of such complicated substances as are represented by feathers, bones, skin, flesh, etc., and as a whole, endowed with the power of voluntary motion, of obtaining and assimilating other material into its structure, and, most wonderfully of all, in due time, of producing other eggs endowed with the same remarkable properties, and thus preserving and transmitting the principle of vitality for an unlimited period. If, on the other hand, we destroy or remove the germinal vesicle before submitting the egg to heat and moisture, what a different set of chemical reactions occur. It is like a clock from which the escapement has been removed. The complex molecules of the albumen and other compounds tumble down like a house of cards, the sulphur unites with the hydrogen—forming the familiar and offensive hydric sulphide—while the other elements rapidly pass through a series of changes continually tending to the formation of simpler compounds, until finally the bulk of the egg is transformed into the carbonic dioxide and water from which it originally came, the small amounts of sulphur, phosphorus, nitrogen, and other elements being also reduced to their simplest inorganic terms. And what is the cause of this difference? Something—whether matter or energy, we know not what,—conditioned upon the existence of a little microscopical cell, which is apparently no different from any other, and refuses to yield up its secret to the most powerful microscope, or the most delicate chemical reagents. A similar condition is found in the vegetable world. The little "germ" present in every seed contains something which sets up and sustains in action the chemical changes which build up a tree from water, carbonic dioxide, nitrogen, and a few mineral salts of the soil. When the time arrives that this mysterious sustaining force is withdrawn, the reactions are at once reversed, and the cellulose and other organic compounds of the plant slowly but surely return to their original water and carbonic dioxide—perchance to again pass through the same cycle of transformations. From the smallest amœba—which, as far as we can tell, is only a bit of albumen endowed with the power of motion—to man himself, everything possessed of what we call life is ruled and preserved by this mysterious principle which differentiates living from dead matter. That our bodies are not ourselves is beyond question, but just what relation the chemical compounds of which we are formed bear to our consciousness, or *ego*, and in what respect one is dependent upon the other, no one can say. The brain of a Hottentot has, as far as we know, the same chemical composition as that of a Newton or Faraday; but the vital force which governs its actions must be different either in its nature or in its mode of action. Nor can we say with certainty that the vital force resides in the brain at all. Portions of the brain may be removed, and life still remains. Only when the nerve centres which govern important bodily functions—such as the action of the heart or lungs—are destroyed, is the protecting influence withdrawn and the elements of the body permitted to return to their more stable combinations. We cannot say from direct experimental evidence that the vital force is indestructible. Whether an amœba or a philosopher die, both revert to the same forms of matter, and we know no more of the future destiny of the force which has conditioned their lives than we do about its nature. But we know that life has certainly existed from the earliest geological ages; and if we speculate—as we may legitimately do—upon the identity of the force which builds up the living being, and that which builds up the inorganic crystal, perhaps from the commencement of the existence of matter, every manifestation of its action in living beings tends to bring about its constant reproduction and transmission to successive generations; after a plant or animal has reproduced its kind, or passed beyond the period when such reproduction is possible, the vital force is gradually withdrawn, and what we call death takes place. And more than this. The constant tendency of this vital principle seems to be towards the production of more complex and highly organized and differentiated forms of life, each generation, on the whole, slightly surpassing its predecessors. In this sense, at least, life may certainly be said to be immortal and progressive; and as the vitality which now animates our bodies must have had an existence for an almost infinite number of previous generations, so it is not illogical to infer that, after the vital principle ceases to govern the matter which now composes them, it may still exist and manifest itself in other ways, in which our individuality or consciousness may be retained and even extended and amplified in the same chain of progress which, according to the best modern thought, has developed the most wonderful of Nature's products, Man, from the lowly ascidian of the primæval seas.—*Pop. Science News.*

Sound of Color.—M. Pedrous, a physician at Nantes, France, has the strange gift of being able to see the color of sounds. He says that human voices are red, blue, black, tan, slate and all colors, and that the color of some handsome women's voices is like that of buttermilk.

Shifting Sands.—The sand along the banks of the Columbia River, in Oregon, is an obstacle to railway traffic, almost as difficult to overcome as the snow blockades during the winter. Nearly every train is delayed on account of the ever-shifting sand hills covering the track.

Aluminum.—It is not generally known that one cubic inch of pure aluminum weighs one-tenth of a pound avoirdupois, or about one-fourth the weight of an equal bulk of pure silver. It can be rolled, spun, stamped, engraved, burnished, polished and soldered to about the same extent and process as used on brass.

Leaf Soda.—At the Pechiney works, at Salindres, France, caustic soda is now prepared for the market in leaves or flakes. This is effected by allowing the hot supersaturated liquor to flow from a funnel between hollow rollers, which latter are kept cool down to a low point by the circulation of cold water within them.

Brief Rules.—"I have never been in a hurry; I have always taken plenty of exercise; I have always tried to be cheerful; and I have taken all the sleep that I needed." These were the rules of health followed by the late Rev. James Freeman Clarke, and he outlived and outworked most of those who began life with him.—*Boston Herald.*

Welds Compared.—In some experiments lately made in England to test the merit of electric welding, a 1½ inch iron bar was welded both by means of electricity and by hand. The former stood a strain of 91.9 per cent. of the strength of the metal itself, and the latter 80.3 per cent. The electric weld, however, showed cracks when bent cold at an angle of 66 degr., while the hand made joint stood 138 degr. of bend.

Before and After.—"Why don't you go to work?" she asked of the tramp.

"I am a-working, lady."

"At what? You show no signs of it."

"No matter for that, mum. I'm a-working as a traveling adver. for a soap firm. I'm the 'Before Using' card, and my pardner around the corner represents the 'After Using' end of the combination. Thank you, mum."

FIRE CRACKERS.

WHENCE THEY COME AND WHITHER THEY GO.

The stock of fire crackers in this country at the present time is said to be from twenty-five to thirty per cent. less than is usual at this season. This shortage is due in part to labor strikes in China, where all the small crackers and most of the large, or cannon crackers, are made, and also to the imposition by the Chinese government of the *lekin*, or tax, both of which have acted as a check upon manufacturers. Strikes are of frequent occurrence in China, and laborers are thoroughly organized, having what are here now called unions and guilds. Strikes are sometimes attended with loss of property as well as of life. The annual receipts of fire crackers in this country are from eight hundred thousand to one million boxes, and orders for these goods have to be sent forward one year in advance. The Chinese manufacturing year begins June 1, and this is about the date when American merchants sent forward their order for next year's supply. The usual voyage from New York to Hong Kong is 120 days, so that there are only left, after a passage to China and return, 125 days of the year. The ship "Wandering Jew" arrived in New York on April 29 with 135,000 boxes of fire crackers on board, and she is the last ship which can arrive before the Fourth of July, the "Great Admiral," now on the way, not being due until August 1. It is, therefore, positively known that there will be a short supply of fire crackers, and this has had the effect of advancing the price from 80 cents a box, which was paid last year, to $1.25 per box. Crackers are made principally in Canton and in the country surrounding that city. A cannon cracker factory in the suburbs of Canton is described by an eye witness as follows: The building is of sun-dried brick, with a tiled roof twelve feet from the ground, and this space is divided into an upper and lower apartment, each with the ceiling about six feet high. The interior of the building when visited was strewn with pieces of paper, while vessels containing powder were standing round, the contents of which seemed to be in imminent danger of being exploded, and men, women and children were actively engaged in the manufacture of the goods. The paper needed for the cracker is cut to the required length and then weighed to see that the quantity for each cracker is exactly the same. The instrument used in weighing is of the rudest description, being a stick about two and one-half feet long, suspended from the ceiling by a string, which is attached to the centre of the stick, and a stone is placed as a weight on one end and the articles to be weighed on the other. The paper is rolled into cylindrical form by means of a flat piece of wood held in the hands, and then one hand is creased with a pair of pincers and a string tied into the crease as a temporary means of preventing the powder from running out when the cylinders are placed in a perpendicular position to be loaded. The last named process is as follows: The cylinders are bunched together like cigars turned on end, and then pinched with an awl, and into the aperture thus made the powder is poured from a tin can. Then the stem of the cracker is inserted which consists of a piece of thin, touch paper, with just sufficient powder twisted up in it to make it burn quickly. A piece of paper is temporarily pasted over the end containing the stem for the purpose of preventing the powder from running out, as the crackers are now placed on that end. The string placed temporarily around the pinched end is now removed and clay tamping is hammered into the aperture and then the paper is removed from the stem end and the clay tamping is applied there, which prevents any powder from sifting out. The cracker is now ready for the thin piece of red paper which goes around the outside and completes it. The stems are then very neatly braided together, which forms the crackers into packs, and these are each wrapped in thin paper and ornamented with a red label with pictures of dragons upon it. Red is the festive color of China, and as fire crackers are used principally on festal occasions, that color is rigidly adhered to in the manufacture of these goods. The packs are placed in boxes and in the proportion of forty packs to the box. There is a regular division of labor in the cracker factory, each person having his or her special work to do, and in this they become very expert. The above is a description of cannon cracker manufacture, but the same will apply to the small crackers. The latter, however, are generally made in the rural districts, and are brought down the river to Canton in junks. There is a large home consumption of fire crackers, and the Chinese think that their explosion will ward off evil spirits. They are fired off on numerous occasions, but particularly on the Chinese new year, which is a variable date regulated by the changes in the moon. Foreigners residing in Canton have what they call the Canton salute, which consists in the firing off at one time of six boxes of small crackers and two or three boxes of cannon crackers, and this is given on the departure of some one of their number for home. Of the million boxes of crackers sent each year to this country, a number are reshipped to South America, where they are used on social occasions as well as at public fetes. They are used in the south at Christmas time, and also in Canada on May 24, which is Queen Victoria's birthday. Cannon crackers are made in this country, but the small ones cannot be produced here at anything like the price they can be furnished by the Chinese. Their product is carried half way round the world, pays duty, and is then sold for 85 cents a box. In the McKinley tariff bill now before Congress, the duty on fire crackers is placed at 8 cents a pound, which will make the tax 63 cents as against 28 cents a box, which is the rate paid now. If this provision of the new tariff bill is adopted, it will probably have the effect of stimulating the manufacture of cannon crackers in this country. Fire crackers are of very ancient origin. Dr. Williams in his exhaustive work on China, entitled "The Middle Kingdom," says: "No evidence exists of the use of gunpowder as an agent of warfare until the middle of the twelfth century, nor did a knowledge of its propulsive effects come to the Chinese until the reign of Yunglop in the fifteenth century—a thousand years after its first employment in fire crackers."—*Scientific American, July* 5.

ROYALTY AT TABLE.

PERSONAL TABLE HABITS OF THE POTENTATES OF THE WORLD.

A Paris correspondent writes entertainingly of royalty at table, as follows: "Pope Leo XIII's way of living is more like that of a country curate than of a prelate. It is lucky that etiquette makes the Pope invariably eat alone, for his guests would have but meagre cheer. After celebrating mass, which he does all the year round at 5 A. M. in his private chapel, he takes a cup of coffee, prepared by his body-servant on a spirit lamp. During his residence in foreign countries, His Holiness acquired the habit of drinking coffee prepared as in Turkey and without sugar, and he clings to this habit even against the advice of his physicians, who tell him that coffee prepared in this way is too exciting, especially when taken on an empty stomach. At about ten o'clock the Pope eats his first meal, which is very frugal and always the same. It consists of two poached eggs, a piece of the breast of a fowl, and, for dessert, some fruit or preserves. Leo XIII. drinks but little wine—never more than one glass of white Frascati—during the whole repast. He will not touch Bordeaux, which is more heady and tonic than the wines in the neighborhood of Rome. At five o'clock the Pope eats his second and last meal, which is as frugal and simple as the first. Many a commoner sits down to a far more sumptuous repast. Soup, one kind of meat, a vegetable, fruit, and a glass of Frascati wine—such is the Pope's *menu*. Queen Victoria breakfasts alone at nine o'clock in summer, at Osborne, Windsor, or Balmoral. This meal is generally served out-of-doors, in some arbor, tent, or summer house. Formerly the Queen took oatmeal porridge as a part of her morning meal. But in the midst of her gold and silver plate and the wealth of orchids, which usually decorate her magnificent court table, the Queen's digestion compels her now to forego the toothsome dainty for lighter tapioca, and to use only stale brown bread, made especially for her needs, and which resembles German rye bread. Her physicians also advised her to give up green tea for cocoa. Luncheon is served at 2, and the royal dinner at 8.30 P. M., when boiled mutton, venison and chicken form Her Majesty's staple dishes. Sir John Cowie, the Queen's aide-de-camp, says that Her Majesty delights in baked potatoes and in cracking a dozen nuts after dinner. The Queen formerly drank every day two or three glasses of champagne or Bordeaux, and after dinner a glass of Tokay; but here again the medicos interfered, and after her recent attack of sciatica, the royal lady had to give up wine for a dilution of whiskey in water or soda water. In her published diary the Queen admits her extreme partiality for Scotch cream and savory haggis. Victoria's household expenses amount to the neat little sum of $425,000. President Carnot is a quiet man, who evidently thinks that simplicity is the chief secret of a good *menu*. He delights, as most Frenchmen do, in *café au lait* (coffee with milk) at 8 A. M., and enjoys his beefsteak, mutton chop, and an omelet *aux fines herbes*, with half a bottle of Chambertin, at noon. Dinner at half-past seven usually ushers in oysters, soup, fish, an *entree*, or the dish preceding the roast. This is the first course, washed down with Bordeaux, and the President declares when he has got so far he has had quite enough, and that the roast, which begins the second course, including, besides game, *relevés* and sweet *entremets*, is superfluous. Of the third course, which includes ices, sweetmeats, preserved and fresh fruits—in short, the dessert—he partakes lightly, and corrects the richness of the whole by a cup of good black coffee, cognac, or Chartreuse, and a *Londres* cigar. In Russia, eating and drinking take up no small part of a man's existence. Alexander III. breakfasts early, at 7 A. M., on ham and eggs, a slice of roast beef and tea. At eleven o'clock he lunches off a poached egg in broth, a mutton chop, cold chicken, game, and two vegetables, the whole washed down with three cups of strong black coffee. The Czar, who is a great angler, has the fish he hooks served up on his table. At 2 P. M. he takes a little rice-milk. Dinner affords a plain but well-cooked meal in the French style. The young German Emperor, who was raised in England, has retained a decided taste for eggs and bacon, which so often figure on an English breakfast table. He has muffins and crumpets sent to him from London. All sorts of baked loaves are eaten at the Berlin court, from the commonest kind of oaten bread to the famous Cummin cake, the recipe for the making of which is a State secret. William II. drinks beer, and has discarded French champagne for sparkling Muller wine. Within the last twelvemonth he has revolutionized the imperial kitchen, dismissed his French cook, and, in his determination to out-German the Germans, ordered the bill of fare to be henceforth written in the national language! Even the word *menu* has been done away with and *speisekarte* substituted. The Empress of Austria is the best royal housekeeper in Europe. Her kitchen is a huge room, with all the arrangements at each end for preparing fish, fowl and beast for the table. Fifty chickens can be cooked at once on one of the big whirling spits. Against the side walls, from floor to ceiling, stand scores upon scores of chafing dishes. In these dishes, all of which are self-warming, the meats are carried to the carving room, whence they are returned to the kitchen ready to be served. The boiling, baking, frying, carrying and cutting occupy a small regiment of servants. Twenty-five male cooks, in white clothes, dress, spit, season and stuff the meats. As many female cooks prepare the vegetables, the puddings and the salads. A dozen or more boys

hurry the birds, fish and joints from the kitchen to the carving room, where long lines of carvers slice and joint everything laid before them. The kitchen utensils fill a big room opening into the kitchen. This room is the ideal of German housewives. The high walls are covered with pans, kettles, griddles and covers, which shine as only German hands and German elbow grease could make them shine. There are soup tureens in which a big boy might be drowned, and kettles in which twins could play house. The Austrian Court dinners are famous on the Continent. The delicacies which result from the protracted meetings in the council chamber of the *chefs* are often so fine that favored guests not unfrequently observe the old German fashion of taking a choice bit home to their friends in the name of the Empress and with her best wishes. And yet, strange to say, notwithstanding this elaborate kitchen, neither the Emperor nor the Empress eat much of the savory viands or dainties elaborated in it. Good, kind, gentle, generous and open-hearted old Francis Joseph takes beer at luncheon, champagne at dinner—never more than two glasses—and smokes the commonest kind of Austrian cigar, a long, thin weed with a straw in it, called a 'Virginia.' This is the favorite smoke of Viennese cab drivers. Over-indulgence in it spoiled his stomach, and for a long time he was forbidden to smoke, but since last year he has begun again. King Humbert is a true vegetarian. He lives entirely on vegetables, *antepastos*, and fruits. The doctors have forbidden him to drink coffee, and his only beverage is at present a little Bordeaux and plenty of water. The King never feels so well as when his fare is bread, potatoes and oranges. When asked by the young German Emperor what his favorite edible was, the King of Italy replied peaches. William II. thereupon ordered $500 worth of the finest samples from Thommery, near Fontainebleau, and sent them to him. The Queen, who used to be very slender, but has of late been growing stouter and stouter, wishes to diet; but it is very difficult to do so, as she enjoys every dainty of the table, and the court revels in the national *frittura* of artichoke hearts, liver, mushrooms, brains, cock's-combs, and so forth, served in a solid gold service. Margherita has tried several times to become a vegetarian, but has given up in despair."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

July.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

GAME AND POULTRY.—Pigeon, chicken, duck.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, egg-plant, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb, corn, beets.

FRUITS.—Cherries, strawberries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple.

PRACTICAL RECIPES.

COFFEE CAKE.—One-half pound of butter beaten to a cream, with one-half pound of sugar, four eggs, added singly; one-half pound flour, in which one teaspoonful of baking powder has been mixed. Pour it on a baking tin, so that it will be one inch thick; strew cinnamon and granulated sugar plentifully over it, and bake.

CHICKEN OR HAM CROQUETTES.—One-half pound of butter, three-quarters of a pound of bread crumbs, five eggs, well beaten; one teaspoonful of parsley, chopped fine; one-half pint of rich cream, one teaspoonful of finely chopped onion, grated nutmeg, cayenne pepper, salt to taste. Mix well, cook for a short time, stirring lightly all the while; let it cool; add one pound of chicken or ham, chopped fine; make into pears, dip in unbeaten egg whites, roll in cracker crumbs and fry to a rich brown.

SWEET CABBAGE PICKLE.—Cut one large cabbage and one-half pint of onions small; put into a pan, add one pint of salt, one-half gallon of water; let stand awhile and squeeze out of the brine; throw into a vessel; add one-half pound of sugar, two tablespoonfuls of mustard, one-half ounce of turmeric, one-half ounce of white mustard seed, one-half ounce of cinnamon, one-half ounce each of allspice, cloves and celery seed; pour over the whole one-half gallon of vinegar; boil until yellow. This is good to eat as soon as cold.

ANGEL'S FOOD.—One and a half tumblers of sugar, one tumblerful of flour, one teaspoonful of cream of tartar, whites of eleven eggs, beaten stiff; one teaspoonful of vanilla; sift flour and sugar separately six times each, then six times together. Bake forty minutes.

LADY CAKE.—Three-quarters of a cup of butter, two cupfuls of powdered sugar, whites of six eggs, beaten to stiff froth; one teaspoonful of essence of almonds, flour enough to make a good batter put in last. Sift it six times. Bake in shallow pans two inches deep.

LOBSTER FRICASSEE.—Remove the meat carefully from the shells, cut it up in pieces, using the coral with the rest. Boil the shells for awhile in some white stock, thicken with flour and butter rubbed together; season with white pepper, salt and mace; add to the lobster and heat thoroughly. Just before serving, add a little lemon juice and a dash of grated lemon rind. The white stock may be made by boiling the shells in one pint of water, adding then a little cream, flour and butter, with white pepper, salt and mace for seasoning.

SPINACH STEW.—Pick and wash very clean as much spinach as will make a dish. Mince finely three small onions, pick and chop two handfuls of parsley; put all into a saucepan with half a pint of gravy or milk, a bit of butter dusted with flour; salt and pepper to taste. Cover the pan closely, stir it now and then, mash it smoothly, and when done serve it with slices of broiled ham or sausages.

GELATINE.

THE IMPORTANCE OF USING THE PURE ARTICLE.

Gelatine is rapidly becoming in universal use as an article of food. When properly made it is delicate, refreshing and to some extent nutritious, but can only be recognized as a luxury. It is easily digested and contains sufficient nutriment to make it a desirable article for invalids. Especially is it highly recommended by physicians in cases of severe fever, etc. As it is so universally used as an article of food, either as jelly or when combined with milk to make ice cream, charlotte russe, blanc mange, etc., it is of the most vital importance that only the very best gelatine should be used. The increasing demand for gelatine has induced, within a few years, a large number to commence its manufacture, which has caused the market to be flooded with cheap and dangerous goods which, were the consumer to realize the danger of using such gelatine, he would not accept it as a gift. It too often occurs that finding the profits do not meet their expectations, they resort to purchasing cheap raw material which is, has been or is on the eve of becoming decomposed. Such raw material is bought at a low figure and eventually finds its way into the market as gelatine. It is a well-known fact to a practical manufacturer of gelatine that there are no known methods whereby decomposed animal matter can be converted back to its original condition. Hence unscrupulous parties resort to the use of acids to cover such defects and destroy the putrid odor which gelatine, made from such material, would have when being dissolved in boiling water or milk. All gelatine having a putrid smell or an acid taste should be discarded. The greatest danger to health in using impure gelatine is when it is used as an article of food in conjunction with milk. How often do we hear of late years cases of poisoning from eating ice cream, and what is the reason? The writer knows firms, that to swell their profits, buy glue at 12 to 15 cents per pound, and sell it as gelatine to be used in the manufacture of ice cream, etc. What is the result? Such goods are invariably impregnated with decomposed matter, and as milk is one of the most susceptible articles of food to its surroundings, we find that its coming in contact with an impure gelatine hastens decomposition in the milk, which is then converted by a chemical action into a deadly poison known as tyrotoxicon, which, without doubt, is the mysterious and deadly agent which has caused so many fatal results after partaking of ice cream. The meagre knowledge which scientists possess of the fabrication and composition of gelatine has very often been the cause of their erroneous conclusions, when investigating the cause of sickness or death produced from eating ice cream. It is an undisputable fact that gelatine is valuable in cultivating a great many micro organisms. This was demonstrated during the yellow fever scourge, when the germs were more readily developed in a solution of gelatine than by any other method known to medical science. It is simply appalling to think of the danger to health in using gelatine as a food unless it is absolutely pure. There are many varieties of gelatine that look handsome, but are death-dealing agents, some kinds so thoroughly impregnated with acid that they have curdled milk when amalgamated. As it would be tedious and difficult for users of gelatine to determine the pure from the impure article, it is advisable, if they appreciate health, to use no gelatine but that which is branded by reputable manufacturers. A wise and safe method for those using gelatine in combination with milk, especially in making ice cream (for therein lies the greatest danger), is to make it themselves. Buy nothing but the best gelatine and other ingredients, which cost but a trifle more than that which is dangerous, thereby compelling to some extent, at least, unscrupulous parties to keep and sell nothing but pure, reliable goods, which are indispensable to those who value their health.—*James Chalmers.*

HOW TO FIGHT CHOLERA.

The news that cholera has broken out in the East and traveled as far westward as Italy, France and Spain is a timely warning to the people of the United States. Experience shows that the dread epidemic seldom reaches the New World the same summer that it does Europe, and that it moves slowly along the routes of travel, and only in the warm season. While this generalization is true regarding the past, it may not be so to-day. Modes of travel have changed so much in the past decade as to constitute a practical revolution. Fast express trains run direct from Brindisi in Italy, Marseilles in France, and Madrid in Spain to Havre, from which ocean greyhounds steam in a single week to New York. Twenty years ago it took more than a month to go from our shores to the Mediterranean; to-day the round trip there and back can be done in less time. Therefore, although it is probable that the cholera will not reach here before May, 1891, yet every allowance should be made for the changed conditions of modern life and every precaution taken, the same as if it were due here in the latter part of August in the present year. Too many precautions cannot be taken. Even if the cholera should not come, the trouble and

money involved are invested wisely. They improve the sanitary conditions of the individual and community, and thereby diminish both the death-rate and the amount of disease. No scientific knowledge is required to prepare for cholera, but only a little work, a little common sense and a few simple household remedies. The city authorities should keep the streets and sewers as clean as possible. The housekeepers should aid in this duty by cleaning the front yard, steps and sidewalk every day. All the stones should be washed and all decaying matter burned or buried. Garbage is a particularly bad customer, and the garbage-barrel an abomination. All the sweepings of the house and the leavings of the dining-rooom and kitchen should be consigned to the stove or, when circumstances allow, the latter buried a foot beneath the soil. As soon as the water of garbage is expelled by high heat all that remains is dry vegetable and animal tissue, which makes a very good fuel. When buried, garbage becomes an admirable fertilizer, accelerating plant growth and increasing the porosity of the soil. Disinfectants are invaluable. For sinks, water-closets, sewer-pipes and privies, copperas and crude carbolic are both cheap and efficient. The former should be dissolved in hot water in the proportions of a pound to two gallons, and the latter mixed with cold water in equal quantities. An ounce of corrosive sublimate dissolved in a gallon of water is the most powerful germicide and deodorizer known, but should only be used in cleaning bath-rooms, house-sewers and the like. A little may be sprayed judiciously upon soiled wearing apparel or the carpet of a sick room. Personally, no more caution is necessary against the cholera than there is to preserve good health. A proper amount of bathing with luke-warm water and fine toilet-soap or a dash of ammonia, a wholesome diet, regular hours, exercise, sun-light and fresh air are imperative, but of even greater importance is that the system should be freed of all impurities. Without the latter all other precautions are in vain. Any first-class remedy which will expel humors from the blood is of great value in this regard, but only one, Ayer's Sarsaparilla, effects a complete purification and renovation of the human body. It acts primarily upon the life-current, from which it forcibly removes all taints, foreign matter and impurities. The blood thus cleansed performs a similar mission in regard to the great vital organs. In this manner vitality is increased, nerve-strength augmented, and physical energy and endurance multiplied indefinitely. Under these circumstances and conditions, anyone can meet cholera or other deadly disease without the least apprehension or danger. These suggestions apply with double force to children and youths. Their active habits involve quick heating and chilling, and their insatiable appetite prompts them to eat foods, the condition, quality and amount of which are too often opposed to all the principles of health. Ayer's Sarsaparilla here works wonders, and when properly used prevents the colds, colics, cramps, summer-complaints, hives, prickly-heat, and other ills so common to childhood. As these disorders cause more than half of the recorded infant mortality of our people, the beneficence and necessity of Ayer's Sarsaparilla are easily seen and appreciated.

ALDEN'S MANIFOLD CYCLOPEDIA.

The twenty-second volume of Alden's Manifold Cyclopedia embraces the titles from Legal to M'Clure. The great merits of this work—its freshness, fullness, accuracy; its combination of dictionary with cyclopedia; its convenient form, and the high degree of skill with which it is being directed—seem to increase with each succeeding volume. Among a great number of interesting topics treated in this volume, we notice Letters and Articulate Sounds; Libraries, about 7 pages; Light; Lithography; among the important places are Leipzic, Leyden, Liberia, London, Long Island; among states, Louisiana; in the line of biography we find Leibnitz, Lessing, Pres. Lincoln, Liszt, Livingstone, the explorer; Locke, and Longfellow. As an educator in the family or school, or assistant in the office or library, this work is invaluable, and its cost is so extremely low as to place it easily within the reach of all. Specimen pages and easy installment terms of payment may be had on request. Garretson, Cox & Co., Publishers, New York, Chicago, and Atlanta.

COPPER WATER.—According to the Butte City, (Mont.) papers, the water coming from the Anaconda and St. Lawrence mines is found to contain sufficient copper to make its precipitation quite profitable. There are over 2,000,000 gallons of water pumped daily, and coming as it does over the old workings, dissolves out a good deal of copper. Several men have built troughs and resorted to the method of running the water over scrap iron from which it is said they are realizing, quite satisfactory results.

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CONTENTS.

CITY SUMMER SANITATION.

The New York Board of Health has appointed fifty physicians of the "Summer Corps," and they are at work now among the tenements, with instructions to prescribe for the sick who are too poor to pay for medical aid. The department will fill their prescriptions. Dr. Cyrus Edison has charge of the corps, whose work will continue through July and August. Last year these doctors visited 264,520 families in 34,511 tenements, and found 16,148 sick persons to prescribe for. They also distributed among the poor more than 12,000 tickets for free excursions on the boats of the St. John's Guild, and nearly $50,000 circulars, printed in English, German and Italian, giving such simple instructions regarding the treatment of sick children as could be easily understood and followed by the people for whom they were intended. This year the doctors will have the advantage of an auxiliary corps in the King's Daughters, who have undertaken to follow in their track, and give such relief and further instruction as are found necessary.

POISONED BREAD.

A Murderous Attack upon the Family Table.

A CHEMIST INTRODUCES POISON INTO A BAKING POWDER.

The attention of the AMERICAN ANALYST was recently called to a circular headed "Good News to Bakers, Grocers and Baking Powder Manufacturers," and issued by Maross Jenkins, 124 Warren Street, New York, calling attention to Dr. Arvine's French Tartar, as being superior to, as well as cheaper than, all other leavening powders now in use. The article in question is endorsed by certificates of three large baking firms in Newark, Yonkers, and New York, and also a certificate of Stillwell & Gladding, chemists to the New York Produce Exchange, who say that "after a careful analysis of Dr. Arvine's French Tartar we recommend it from a hygienic standpoint as a pure and wholesome article of full strength, and free from alum or other adulterants." This powder being offered for sale at a price much below what a phosphate powder could be made for, was subjected to analysis by Messrs. Wyatt & Weingaertner, who having tested it for tartaric, phosphoric and citric acid, finally found it to consist principally of OXALIC ACID. A call upon Mr. Jenkins showed that he was only the agent for selling the powder, which was manufactured by F. W. Arvine of 32 Washington Street, New York, who was formerly a chemist in the employ of the Standard Oil Company. In a letter from Mr. Arvine, which was seen by our representative, Mr. Jenkins was assured that the powder was all right, not to be frightened but to go right ahead and to furnish "steer samples" to any one who might enquire. What was meant by "steer samples" can only be inferred, as Mr. Jenkins could not or would not explain. Before showing this letter, however, he had given our representative a sample of the powder as sold by him. Afterwards he gave another sample of a powder which he said was much stronger, 5 lbs. would neutralize 3 lbs. of Natrona soda, while of the former 2 lbs. would neutralize 1 lb. Both these samples when tested by Messrs. Wyatt & Weingaertner were found to contain oxalic acid. In order to ascertain if Messrs. Stillwell & Gladding had any explanation to make, our representative called upon them and saw Mr. Gladding, telling him what had been found. He ridiculed the idea of oxalic acid having been found in the powder; said they had made a complete analysis of it, and that there was no oxalic acid present. Not knowing at the time that the two samples were unlike in composition, and supposing that the second sample only differed in being stronger, our representative asked Mr. Gladding to make a qualitative test of a portion of the second sample. This was afterward found to contain some phosphate Not knowing this and supposing it to be the same, our representative told Mr. Gladding that it contained no phosphate. Upon testing it and finding phosphate present, Mr. Gladding refused to test for oxalic acid, and warned our representative to be careful of his statements. Thereupon samples of the powder were given to Dr. Gideon E. Moore, 221 Pearl Street, and also to Dr. Theodore Breyer, of 110 Front Street, both chemists of eminence. Dr. Moore reports that "the sample consists essentially of a mixture of oxalic acid and corn starch, with small quantities of soda, lime and phosphoric acid. *The acid strength of the sample is due exclusively to the oxalic acid that it contains,"* Dr. Breyer precisely corroborates this. Drs. Wyatt and Weingaertner gave the following certificate of their analysis: "We have examined the two samples of 'French Tartar' submitted by you, marked 'A' and 'B' respectively. We find that the sample 'A' is a mixture of starch and oxalic acid, and that it contains no other acid principle capable of exercising any action in baking powder. Sample 'B' is a badly-prepared and much-discolored acid phosphate of lime and starch powder, containing considerable quantities of oxalic acid."

It will be readily understood with what feelings of consternation these certificates were received. Dr. A. W. Blythe, the well-known authority on modern toxicology, speaking of oxalic acid says: "The smallest dose of oxalic acid known to have destroyed life, is sixty grains. With regard to oxalate of soda (this is the compound that would be formed by mixing bicarbonate of soda with the "French tartar,") half an ounce has been taken without fatal results, although the symptoms were very serious and it may be held that about that quantity would usually cause death. Two grains of sodic oxalate administered to a cat subcutaneously daily for six days produced death. The cat died, as it were, from paralysis, commencing at the hinder extremities. Oxalic acid is absorbed into the blood and leeches have been known to die after being applied six hours after the acid had been taken." This "French tartar" contains about forty per cent. of oxalic acid, the rest being starch. Two teaspoonfuls of baking powder prepared from it would therefore contain about thirty-five grains of oxalic acid. As two teaspoonfuls are used for a quart of flour, it naturally follows that every pound of bread made from it contains about eighteen or twenty grains of oxalic acid or about twenty-one and a half

grains oxalate of sodium. The effect of this poison, while it may not be productive of immediate death, is that of a solvent on the mucous tissues with highly irritating effects, and an equally injurious effect on the nervous system. Under these circumstances we deemed it our duty to send the following notification to the Board of Health:

NEW YORK, *July* 18, 1890.

Board of Health, New York.

Your attention is called to a so-called Baking Powder sold under the name of "Dr. Arvine's French Tartar," by Maross Jenkins, 124 Warren Street, and manufactured by F. W. Arvine, 92 Washington Street. This contains about forty per cent. of oxalic acid. It is made in different strengths, and different samples have been furnished by said Jenkins. The powder has been used by the N. Y. Baking Co. here, and several others outside of this city.

Very respectfully.

THE AMERICAN ANALYST.

It now remains for our Board of Health to take the necessary step to prevent such a dangerous preparation from coming into general use. We have done our duty.

ELECTRO-THERAPEUTICS.

THE USE OF ELECTRICITY IN THE TREATMENT OF DISEASE

By A. WILBUR JACKSON, M. D., F. S. Sc.

Until a very recent period the medical profession has almost entirely ignored (where it has not scouted) the value of electricity as a remedial agent. A very few scientific investigators in the field of therapeutics, recognizing the possible value of this mysterious agent, began to experiment therewith, and after a time lent the weight of their names and reputations to the efforts made to induce others to make use of the means so providentially supplied by nature, and, so to speak, ready to hand. Such men as Rockwell and Beard, Morgan, W. M. Hammond, Massey, Ranney and many others in this country; Reynolds, Althaus and Inglis Parsons, in England; DuBois Reymond, Becquerelle, Charcot and Ducheune, in France, and Helmholtz, Remak, Meyer Benedict, in Germany, are among the foremost names which have been closely identified with research into this particular field. All these learned and accomplished men have added testimony beyond dispute to the efficacy of electricity as a curative agent. In short, the value of this agent has been too firmly established to admit of denial, and the sole question which now presents itself to the practitioner who makes use of it is as to its versatility, its adaptability to this or that diseased condition, and the rules which should govern its application. These latter conditions demand much study and experiment on the part of the practitioner who would be considered a competent electro-therapeutist. It is one thing to provide oneself with a costly and complicated armamentarium of batteries, electrodes, etc., and another thing to wisely and usefully employ them. Many physicians will assert that they are able to control a large proportion of the diseases which they are called upon to cure with the medicines which are in use generally. Unfortunately for themselves and their patients, they are forced to confess that there are many cases which go from bad to worse, even under the most wisely directed medication; and it is just here that we would claim that electricity, rightly employed, will accomplish, in many of these cases, all that medication fails to do, and much more. But it is absolutely necessary that electricity be employed in a thoroughly scientific manner, or it is worse than useless. Many a physician has been told by his patient that "he has understood that electricity is used with success in such cases as his (the patient's) own, and the doctor either puts him off with a derisive reply, or says, "Well, I have a battery and will use it on you," rather than call in an experienced operator. The battery referred to is probably a small Faradaic machine, and the patient is given the electrodes to hold in his hands; and because benefit does not follow such "electrical treatment" the patient and his physician thereafter condemn electricity as a so-called remedy wholly without value. No two cases are alike, and there are many points to be considered before applying the current—which form of current is to be employed, whether galvanic or Faradaic, or perhaps the static? Also the polarity in relation to the patient's condition, and the end to be gained; the strength of current, whether to commence with five or fifty milliamperes? Not, by the way, so many "cells," as many self-styled electro-therapeutists are in the habit of gauging their current strength. Such a description is worse than none, and no enlightened practitioner will think of working without a reliable milliamperemeter. In reading an article not long since, written by a so-called medical electrician, I found that he described a certain current strength as so many "milliamperemeters," instead of milliamperes! Again, there are many diseases, some among them of the most fatal description, which electricity, properly employed, can with certainty reach, control and cure, where medicines are often totally inefficient. Rheumatism, neuralgia and various paralytic affections may be cited as examples. There are also many cases of inflammatory nature, internal, traumatic, which are not to be reached by medicine, but which may be controlled with certainty by the electrical current, understandingly applied. Certain fevers, of virulent nature and miasmatic origin, are also amenable to galvanism or electricity. Cases of asthenic nature, which defy the medicines of the pharmacy, yield and soon disappear when treated by the electric current. As before stated, the great majority of the members of the medical profession know little of the protean character of the electric current. They are utterly unaware of the electrical conditions of the human organism in a state of health, and how it is effected electrically when diseased in any of its numerous complicated parts. They know nothing of the physiological action of the several modifications of the electric "fluid," galvanism, magnetism, Faradism and static electricity; and worse even than this, but few are acquainted with the laws governing the current in its flow from pole to pole, or the effects upon animal or other tissue to be reached by employing the positive or negative electrode. In effect there is only one means by which success can be attained through the use of electricity as a remedial agent, and that is to first study its properties, etc., and become thoroughly acquainted with its workings before making use of it in practice. In the treatment and cure of diseases of all classes, electricity has its place, and in some of the most malignant and heretofore hopeless forms of tumors the galvanic current has lent its aid to such purpose as to astonish and rejoice those who have seen and experienced its workings. Dr. Inglis Parsons, of London, England, reports upon his experiences with high-voltage currents in the destruction of cancerous growths, and states that, while normal tissue may have the quality of recuperation from any attacks made thereon by the subtle element, yet cancerous tissue, being of a lower order of cell construction and vitality, may be checked in its growth, and by properly-directed currents of sufficient power entirely destroyed. If he is right, and we certainly believe him to be so, from our own experience in the same field, then the true method of dealing with this disease has been found. The operation is simple enough, but none but an expert with galvanism should attempt it, as too many *faux pas* might occur. The patient having been anæsthetized, a current from a battery of seventy cells, E. M. F. 105 volts, is flashed through the growth from side to side, beginning with ten milliamperes, and cautiously increased to 600 milliamperes, closely watching the patient as to pulse, respiration, etc. The results are as follows: Growth ceases, pain is alleviated, tumor hardens and shrinks, and the general health improves. The character of the tumor changes to an inert fibrous mass, which may be removed by the knife if so desired. The writer's experience has been corroborative of that related by Dr. Parsons, and he believes that the day has come when early and radical operation by the surgeon's knife in most cases of cancer will be superseded by the needles and battery of the surgeon who posts himself properly as to their employment. Of course, the actual cases which can be cited as examples of this method of extirpation are but, comparatively speaking, few; but even in these few instances the results are so full of encouragement that we should not be justified in adhering to older methods. We do not wish to be understood as advocating electricity as a cure-all, but that it is an agent which is too little understood and too generally under-valued is, in our opinion, a fact incontrovertible. The profession at large cannot too soon make a general effort to rescue this valuable agent from the hands of the many charlatans who flood the columns of the newspapers with their cards, and whose signs, setting forth the information that they are "medical electricians,"

HYPNOTIC DANGERS.

INVOLUNTARY CRIMES COMMITTED BY HYPNOTIZED SUBJECTS.

The present outbreak of hypnotism, or mesmerism—for they are identical—has begun to engage the attention of the authorities on the Continent. The practice of this art has been recently forbidden in the French army and navy, and is shortly to be restricted in Belgium to members of the medical profession—at least so far as the young and the insane are concerned. This is not the first time that such a step has become necessary. Early in the century mesmerism, which had languished during the troublous times of tho Napoleonic wars, sprang up again with tremendous energy upon the conclusion of peace, and speedily overran Europe. This was particularly the case in Germany, where the Berlin Academy of Science offered a prize for the best essay on the subject; and in 1817 it was found necessary to make the practice illegal, except in the hands of qualified physicians. So, too, in Denmark, about the same time, and in Russia, in 1825. The reasons for this were, no doubt, the same as those which induced the university authorities at Oxford and Cambridge, some fifteen years ago, to forbid the seances of a certain well-known professional mesmerist in those towns. The undergraduates used to flock to these performances, and many of them suffered seriously in health from the nervous derangement consequent upon repeated hypnotization. It is, indeed, denied by no one except Professor Bernheim and the other hypnotizers at Nancy, that the process may be attended by some danger to health. "L'hypnotisation est un agent perturbateur a un haut degre du systeme nerveux," is the authoritative statement of M. Paul Richer in the "Dictionnaire Encyclopedique des Sciences Medicales." It often develops or aggravates attacks of acute hysteria, and cases have occurred in which, after hypnotic catalepsy, for instance, the use of an arm has been lost for some time, or the perception of colors impaired through the induction of visual hallucinations. But it is not only this aspect of the matter which has engaged attention abroad. The remarkable studies in somnambulism and in the unlimited power of suggestion which have been carried out at Nancy, open up another and a more serious set of questions touching the relations between hypnotism and crime. These questions may be considered under three heads:

1. The observed phenomena of somnambulism (which is a hypnotic condition) show that somnambulists may unconsciously but spontaneously commit unlawful acts of which they have no knowledge and recollection when awake. In such cases, although really irresponsible

and ignorant of what they have done, they may be held guilty and punished accordingly. A case illustrating this point is the Affaire L. R. (Loire-et-Cher, 1883). A servant girl was accused of having robbed her mistress, and was sent to prison. It turned out that she had been accustomed to be hypnotized by a doctor; he recognized her in prison, and was allowed to hypnotize her again as an experiment. In the hypnotic state she at once recollected having moved the missing things in order to put them in a safer place. She described the place to the judge, who found them in the spot precisely according to her description, and she was immediately released. The fact was that she had become somnambulistic through being hypnotized, had moved the things in this state, forgetting, as is usual, what she had done on waking, but remembering again in the hypnotic state. It is easy to see how miscarriages of justice may occur in cases of this nature. Not only may the irresponsible hypnotic be condemned for a real or supposed crime, but suspicion may fall upon wholly innocent persons. Several instances have occurred in the French law courts.

(2.) Crimes may be committed on persons in a condition of hypnotism. It will be enough to mention the following actual cases: Affaire Levy, 1879:—Levy was a dentist who hypnotized one of his patients, a young woman, and utilized the opportunity to commit an assault. She knew nothing of what had happened, but when the consequences became apparent he confessed the crime. He was prosecuted by the young woman and her mother, made a full confession in open court, and was sentenced to ten years' penal servitude. But if she had not become enciente the crime would never have been discovered, and if he had not confessed it could never have been proved. Affaire Castellan, 1865: Josephine Hughes, a respectable young woman living with her father, was hypnotised by Castellan, a vagabond mesmerizer to whom they gave shelter. He compelled her to leave her home, follow him and live with him, though he was a filthy and repulsive creature. She was rescued, all the facts fully established, and Castellan sentenced to twelve years' hard labor. In court he offered to give proof of his powers. All she remembered was being compelled to submit to him by an irresistible power. Kidnapping children: Dr. Esdaile, a Scotch surgeon in India, and an expert mesmerizer (he established under the Goverement in 1845 a hospital at Hooghly, in which he performed several hundred operations under hypnotic anæsthesia), had reason to suspect a native barber of kidnapping a boy under hypnotic influence. His suspicions were aroused by the boy's appearance. He tried experiments which were repeated in court, and found he could make natives follow him involuntarily. The man was condemned to nine years' labor in irons; the sentence was confirmed by the Supreme Court, but eventually remitted by the Government. A similar case is related in a Malacca journal of 1820. These cases are particularly interesting, as children are extremely sensitive to hypnotism. At Nancy there has not been a single failure with children under 14 years of age.

(3.) Hypnotized persons may be made, by means of "suggestion," the unconscious and involuntary agents of crime. With regard to this point, which is the most interesting of all, it is only right to say that the brilliant and scientific body of Paris physicians who practise hypnotism do not greatly believe in the danger. They maintain that hypnotism is a morbid condition allied to hysteria, which can only affect in its higher manifestations a small number of people; and they deny the all-important part ascribed by the Nancy doctors to the power of suggestion. In this they labor under the disadvantage of having to maintain a negative position, which may easily be overthrown by a more extended experience, and are probably—we may say undoubtedly—wrong. The susceptibility to suggestion may not be so universal as it is thought to be at Nancy; but its danger, when it does exist, can hardly be exaggerated. As Professor Beaunis says: "It is of no use to try and minimize the gravity of this fact, and it is far better to recognize it as it really is—that is to say, the absolute power in certain cases of the hypnotizer over his subject." The history of mesmerism is full of instances of persons in the higher mesmeric, hypnotic or somnambulistic state—the word does not signify—performing acts in obedience to the will of another, with complete abolition of consciousness, of volition, and of subsequent recollection. There is nothing new in this. As early as 1784 De Puysegur, Mesmer's pupil, pointed out the danger of the magnetic condition, as it was then called, being turned to criminal purposes in unscrupulous hands; and Teste, writing about 1840, declared that a subject "belongs body and soul to the magnetizer if he is base and dastardly enough to use the power." The Nancy doctors have discovered nothing new; but they have developed the phenomena with greater fulness and exactness than their predecessors, and have lent the cachet of scientific observation to facts which have been previously received with suspicion or openly scouted as ridiculous or impossible. M. Liegeois, professor of law at Nancy, has especially investigated the medical-legal aspects of the matter. The chief points are these: Certain subjects can be made to do whatever is suggested to them, not only at the time, but at any fixed date afterward; they remember nothing of the suggestion, but when the time comes they do the thing, believing themselves to be free agents; they can be made to commit unlawful acts against their own conscience. The truth of these statements rests upon numerous experiments attested by a number of independent witnesses, whose intelligence and integrity are beyond question. Thus suggestions have been made to hypnotic patients that they shall perform certain acts a week, a month and even several months afterward, and they have done them exactly at the given time, forgetting all about it in the meanwhile and believing themselves to be free agents. On October 12, 1884, Professor Bernheim suggested to a patient that he should present himself at Dr. Liebault's house on October 12, 1885, and should there go through a complicated series of acts. Nothing more was said, but on the appointed day the patient faithfully carried out the programme, displaying a better memory than Dr. Bernheim himself. Again, two ladies were made by Professsr Beaunis actually to steal silver spoons and commit other acts from which they would have shrunk with horror. Other patients have been made to commit (imaginary) murders, both with poison and with knife, and have exhibited all the emotions proper to the occasion. An interesting point is that of resistence; there is resistence to immoral acts, the patient retains a sense of right and wrong, but the resistance may be overcome. No case of this kind has yet come into the law courts, and these are only "crimes of the laboratory;" but it is obvious that a door may possibly be opened for the commital of crime with almost absolute impunity. At any rate, the whole subject is one which merits earnest attention. Perhaps the best safeguard is to give wide publicity to the facts, so that people may know the danger and refrain from exposing themselves. But it is also the duty of the authorities to consider whether a practice which is certainly harmful to the individual, and may be dangerous to the community, should be allowed te be carried on in the form of sensational public exhibitions.—*Saturday Review.*

THE TELEGRAPH.

STATISTICS OF THE WORLD'S USE OF THE WIRES.

According to the writer who has taken the trouble to hunt up the statistics of this branch of the business, there are now in use throughout the world 2,500,000 miles of telegraph wire—enough to surround the world with 100 strands. Of the sum total of lines, those of the United States constitute a little more than 30 per cent., and our mileage is increasing more rapidly than that of any other country on the globe, says the *Electric Review.* Sixty-one per cent. of the telegraph lines of the world are owned and operated by governments. Leaving this country out of consideration, about 88 per cent. of the remainder is under control of governments; or, leaving the United States and Canada out, fully 95 per cent. is owned by governments. As to the charges for the transmission of messages, they vary greatly. It would be supposed that in the United States, the birthplace of the electric telegraph, the tariff would be lower than elsewhere, but it is not. In North America, the body of the message only is charged for; in other countries the address or signature, or both, are tollable. In the United States, the toll ranges from 25 cents to $1 for 10 words, according to the distance; in the Argentine Republic, it is 40 cents for 10 words, and 20 cents for each additional 10 words; in Denmark and in Sweden, and Norway, 13.4 cents for ten words, and 1.34 cents for each additional word; in Ecuador, 20 cents for 10 words; in Egypt, 49.6 cents for 10 words; in Germany, 1.4 cents per word, the minimum being 14 cents per message; in the United Kingdom, six pence for 12 words; in the Cape colonies, 1 shilling for 10 words and six pence for every five words or part thereof; in Guatemala, 25 cents for 10 words, exclusive of the address; in Honduras, 25 cents for 10 Spanish words, and double that amount for English words; in Italy, 20 cents for 15 words, and 1 cent for each additional word; in Japan, 4 cents per word, including the address and signature; in Portugal, 5 cents for the first word, and 1 cent for each additional word; in Roumania, 1.56 cents per word; in Siam, from 35 cents to $3.65 per word; in Switzerland 1½ cents per word; in Turkey, 2 and 4 cents per word, and in Venzuela, 20 cents for 12 words. In New Zealand messages are classified as urgent, ordinary and delayed, the rates being respectively 2 shillings, 1 shilling and 6 pence for ten words, with a half penny for each additional word. We of the United States do not lead the world in the use of the telegraph, though many think we do. In fact, we fall behind some nations counted as inferior. Within the years 1870-1889 the increase in population in England has been 18 per cent. the increase in the number of letters carried, 70 per cent., and the increase in the number of telegrams, 455 per cent. In the United States in the same time the increase in the number of messages was 380 per cent.

TO REMOVE THIRST.—Paint the tongues of your fever patients with glycerine, says a physician; it will remove the sensation of thirst and discomfort felt when the organ is dry and foul.

TO STOP LEAKS.—To fill up cracks in a boat, melt equal parts of pitch and gutta percha in an iron pot; thoroughly mix by stirring. Make up in sticks and melt into the cracks with a warm iron.

ELECTRIC MILL.—Belfast, Ireland, boasts of an electric grist-mill on one of its wharves, the power being delivered by a 39-horse-power Thomson-Houston motor. The mill is equipped with a set of stones and one roller-mill, and it can turn out from 300 to 400 bushels of meal per day.

OATS TO RUSSIA.—The short supply of oats in Russia has compelled French contractors and Government agents to send to the United States for oats for the cavalry horses of the republic. American oats are drier than Russian, which is a decided advantage when such large quantities have to be stored in the military depots.

SEWING MACHINES.—It is strange how badly we get important matters of history mixed. Ask any well-informed person who invented the sewing machine and the reply will be Elias Howe, which is far from the truth in the case. The first sewing machine was patented in England by Thomas Saint in 1760, sixty years before Howe was born. One of Saint's old machines is now on exhibition in the Royal Agricultural Hall, Islington, England.

CORRESPONDENCE.

A VEGETARIAN PROTEST.

75 PRINCESS STREET, MANCHESTER ENGLAND, *June* 16, 1890.

Editors AMERICAN ANALYST: The facetious remarks on the subject of vegetarianism under the heading "Vegetarian Chicago," in your issue of June 5th, might be considered a joke, were it not for some few sentences, to one or two of which I would like to ask attention. The statement for instance, that "vegetarianism long ago received its death blow at the hands of physological science, but its skeleton is galvanized at irregular intervals and made to dance before the public as a living substance." I suppose this statement is made in all seriousness, but surely the writer must have been dreaming when he penned those lines. There never was a period when vegetarianism had more life, and was less like a merely galvanized skeleton, or when physiological science was more ready to acknowledge the soundness of the principles upon which it is based than the present time. Then again to say that "animal food is essential to vigorous growth of body and mind," is to controvert the teaching of the most eminent of scientists, and to deny innumerable facts, which prove the contrary to be the truth. In spite of all the disadvantages resulting from many generations of erroneous dietary habits, and for the proverbial "second nature," arising out of habits long continued, we yet find that those who abandon the use of animal food and adopt a vegetarian dietary—which is more in accordance with the structure and functions of the human body—become in innumerable cases more vigorous in body and clearer and stronger in intellect as a result of the change in food, thus substantiating by their experience the teachings of science that animal flesh is not the natural food of man. However absurd it might be for the Esquimau, "Mrs. Chinook," to try and provide for her household such an asthetic menu as you suggest, some of your readers if prevented in the hot season from seeking relief at Saratoga or elsewhere, might find such a menu a decidedly pleasant change from the ordinary round of indigestible dishes and satiating flesh meats. Unless they would prefer to make a change the other way by sending the fruits to "Mrs. Chinook" and taking in exchange, her whale blubber, train oil, and other concomitants of an ordinary arctic menu. Joking apart, if any of your readers wish to understand more clearly what vegetarianism really is, I shall be glad to send a few papers on the subject to anyone who will write for them.

I am, yours faithfully,
JOSEPH KNIGHT.
Secretary of the Vegetarian Society.

SOCIAL SCIENCE AND STYLE.

DR. EDWARD ATKINSON STATES HIS CASE IN SHORT WORDS.

At the annual meeting of the Phi Beta Kappa Society of Dartmouth College, on June 25, the oration was delivered by Edward Atkinson, LL. D., of Boston. His subject was "The Interdependence of Men." In one part of his oration he said: "If one wishes to bring the relations of men which are covered by this long word 'interdependence' fairly before his mind, it may be the best way to treat the subject in a few sentences in which the average number of letters per word shall not exceed four. As I am speaking to students who may be assumed to have excelled in literary work, I venture to bring before you this suggestion in regard to style. Write or dictate in your accustomed way; then revise your copy, strike out every long word, and replace it with one or more short ones. The effect is curious. What is this conception of the interdependence of men and of nations? What are the beneficent results which ensue from the elimination of time and distance in the conduct of commerce? I will try to put this lesson into very simple words. This man lives on a good bit of land, from which with little labor he can get a big crop. But he cannot put upon it the kind of sheep that will yield the sort of wool that he needs to make his clothes of. The next man can dig ore out of the side of a hill, and can dump coal with the ore from the side of the next hill into a furnace. He can make pig iron with little work at low cost, but he can't raise wool or grow hay. The next man can cut wood; he can also put iron and wood into tools, and he can put up a mill to grind wheat or to weave wool in. Over the way that man lives in a bit of land where he can grow only a little wheat; where he can make no iron, but where he can clip wool of the right sort to put into the best kind of cloth. Of course these men all swap, each with the other; each gets more of what he wants than if he tried to be "independent" and to do all his own work. Modern science has shown men how to lay rails, and to lay wires, so that it does not matter much if the next man is 100, 1,000 or 10,000 miles away. When these men swap they are "interdependent." What shall be said of the common sense of the men who try to stop them from swapping? What kind of money do those men need? The best kind. No one gets money in order to keep it, unless he is a fool. He gets money in order to spend it. He wants the best money that he can get, in order to get the most out of it. What shall be said of the men who try to force him to take poor money in place of good money? This man wants fish, but he doesn't want to catch the fish; he had rather make shoes. That man wants shoes, and likes to fish. What shall be said of the common sense of the man who sets himself up as a wise man who says: 'You had better make your own shoes and be independent. And you had better catch your own fish and also be independent. If you don't we'll send a ship of war to stop you from swapping fish for shoes.' That is the kind of work that our members of Congress and Senators are now doing in Washington; and they are trying to make people believe that such is the way to be 'independent.' I submit this short lesson in social science as an example of a style which is not fine writing or of newspaper English. It is given in 415 words, averaging 3½ letters each."

WOOD WARPING.

HOW TO OVERCOME THE TENDENCY TO CURL.

As lumber is now sawn, every board but one will warp and curl up in the process of seasoning. The reason for this is plain. If the board be sawn from the side of a log, the grain rings of the wood lie in circles, which have a greater length on one than upon the other side of the board. A board cut from the very centre of the log has grain circles of equal length upon each side, and will lie perfectly flat when seasoned. When selecting the lumber for a tool chest or some other fine job, pick out boards which show that they came, as near as possible, from the centre of the log. A method is in use which compensates for this tendency to curl in seasoning. This is known as quarter sawing, and quartered oak, of which so much is said at present, is sawn by this process. It consists in cutting out boards radially from the centre to the outside of the log. Suppose a log to be split into four pieces, each of these pieces is sawn diagonally so that the grain rings run through, instead of the circles running into, part way through and out upon the same side of the board. Quarter sawn lumber will not warp in drying, neither will it yield so readily to changes of weather. It has the disadvantage of being more expensive, as in sawing each quarter a narrow board is first taken off, then one a little wider. The boards increase in width until the middle of the quarter is reached, making the widest board equal to half the diameter of the tree. The narrow boards may be glued up into wide strips, but that shows considerable sap, and they cannot be used in some kinds of work. To prove that the circles or sap rings cause curling during the seasoning process, it is only necessary to take such curled boards and wet the concave side or apply heat to the convex side. If each or both be done, the boards will straighten out forthwith. This method is often taken advantage of by carpenters, in working twisted or warped boards. The seasoning process is also controlled by frequently turning boards over so that each side may receive just enough heat and air to keep the boards flat.—*Woodworker.*

NEW BOOKS.

SECRET NOSTRUMS AND SYSTEMS OF MEDICINE: A BOOK OF FORMULAS. Compiled by Charles W. Oleson, M.D. Chicago: Oleson & Co. 1890.

The preface of this compilation disarms all criticism but one, by frankly admitting the utter want of reliability of its contents. The point of criticism not disarmed is that there is no value in the book whatever, and therefore no reason for its existence. As has been said, it is a compilation of so-called exposes in medical and pharmaceutical journals, and, as these published formulas are notoriously incorrect, of what use is such a book? Its principal source of information seems to have been the *New Idea*, an organ of a so-called pharmaceutical manufactory in Detroit. A correct analysis of any preparation made by any other firm has never yet been known to have been published by this sheet. Attacks have been made indiscriminately on the vilest nostrums as well as on the preparations of some houses that have been long and favorably known as honest, reliable and helpful manufacturers of pharmaceutical preparations of the greatest value, and these attacks have in nearly every instance been found to be as devoid of truth as of principle. The only guide by which the *New Idea* seems to have been controlled was evidently to attack and destroy the reputation of everything which stood in the way of the various manufactures of the house whose organ it is openly proclaimed to be. A book taking the bulk of its information from such a source cannot serve any useful purpose. In a few instances, where information has been culled from different mediums, a few reliable recipes have been given. Notably is this the case where Professor Andrews' work on Special Surgery has been quoted, but even here, the original work being accessible, no good purpose is served by mere extracts. The title of the work before us is a misnomer, for it does not confine itself to publishing the pretended formulas of secret nostrums, but publishes so-called formulas of pharmaceutical preparations which have always been kept strictly within the medical profession largely, and acceptably employed by physicians, and never advertised to the public or proclaimed as general cure-alls in the usual style of nostrum venders. Most of the so-called analyses given in this book are evidently the results of guess-work, and very poor guessing at that. For instance, in the formulas given for the several preparations made by J. C. Ayer & Co., who have published their genuine formulas, there is hardly a similarity between the two. Two formulas for Listerine are given entirely dissimilar, and neither one correct, as we happen personally to know. Another inaccurate and misleading formula is that for Cuticura Ointment, which does not even give the color or flavor of the original. The formula for Fellows' Hypophosphites is equally incorrect, and is taken from an article written by the competing house of Parke, Davis & Co., of Detroit, who tried ineffectually to introduce a substitute for this much-used preparation. Garfield Tea, a much-advertised nostrum, has been analyzed by competent chemists and the formula has been printed, but that given in the book before us gives but one ingredient correctly. But there is no need for further comment. Enough has been said to show the utter worthlessness of the book under consideration.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

July.

GAME AND POULTRY.—Pigeon, chicken, duck.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

FRUITS.—Cherries, strawberries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple.

VEGETABLES.—Beans, cucumbers, carrots, cauliflower, egg-plant, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb, corn, beets.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

PRACTICAL RECIPES.

MUSHROOM SOUP.—Take one pint of fresh mushrooms and let them stew slowly until they are quite done, adding butter, pepper and salt. Or take a can of French mushrooms and heat them thoroughly in butter, pepper and salt. Heat two quarts mutton broth, add the mushrooms, let all boil up and serve.

COLD VEAL PIE —Cut some thin slices of cold cooked veal. Butter a pie dish, put in a layer of meat and a sprinkle of pepper, salt, chopped parsley and finely shredded sweet herbs, add a few slices of cooked ham, or fried bacon. Slice a hard boiled egg and lay it over the top of the ham. Pour in a little cold gravy or stock. Cover with paste and bake a fine brown.

HAM WITH CREAM GRAVY.—Put two tablespoonfuls of butter into a frying-pan; when thoroughly melted and very hot add two tablespoonfuls of flour; when well mixed add enough milk to make it the consistency of thick cream. Add some thin slices of cold ham and some chopped parsley. Serve with thin slices of dry toast.

BOSTON BAKED BEANS.—For Sunday's breakfast. Boil one quart small white beans in two waters, pouring off the first after a short time. Let them cook till they are quite tender but whole. Put them in the bean-pot with half a pound of salt pork, one table-spoonful of molasses, and a very little salt. Bake all day and night in a slow oven. In the morning pour them out into a dish and serve with the pork on top.

VEAL PANCAKES.—Make a batter, allowing three eggs and half a teaspoon of baking powder to one pint milk. Season with pepper and salt and add enough flour to make good pancakes. Fry even, round cakes. Have ready some finely minced and highly seasoned veal. When the pancakes are just set put some veal in the centre of each. When done roll them up and serve as hot as possible.

APRICOT BLANC MANGE.—Cut one and a half dozen apricots in two and take out the stones; boil them in a syrup made of half sugar and half water, let them cook till they are very tender, then rub them through a sieve. Put three cupfuls of fresh milk and half a cup of sugar, to boil, in a farina kettle. Beat well the yolks of eight eggs and add them to the milk when it just comes to the boiling point. Stir this faithfully till it thickens, but do not let it boil. Have one ounce of gelatine dissolved in a little water, strain the custard, add the gelatine and stir till nearly cold. Mix the apricots with the custard and pour it into a buttered mold. Serve when it is stiff and very cold with or without whipped cream.

VEAL OMELET.—Beat well eight eggs, yolks and whites together; add to them half a cup of milk, pepper and salt, and a dash of grated onion. Put a piece of butter the size of a walnut into a frying-pan and when very hot pour in the eggs. As they cook pick the stiffened egg at the bottom with a fork so that uncooked egg may run through to the pan. After cooking for a few moments, take half a cup of minced veal and half a cup minced ham, season them highly with pepper, salt, and put the mixture in the centre of the omelet. Serve very hot.

CHEESE CENSUS.

AN ESTIMATE OF THE POPULATION OF RIPE CHEESE.

Mr. Adametz has just made some microscopic researches upon the microscopic organisms that inhabit cheese. From an examination of Emmenthal, a soft variety of Gruyere cheese, he has obtained the following results: In each gramme of the cheese, when fresh from 90,000 to 140,000 microbes are found. The number increases with time. Thus a cheese 71 days old contains 800,000 bacteria per gramme. The population of soft cheese 25 days old and much denser than the preceding is 1,200,000, and that of the cheese 45 days old is 2,000,000, microbes per gramme. But the population of cheese is not everywhere distributed the same in it. The centre is but moderately inhabited with respect to the exterior portion. The population of a soft cheese, near the periphery, is from 3,600,000 to 5,600,000 microbes. According to the mean of these two figures, there are as many living organisms in 360 grammes of such a cheese as there are people on the earth.—*La Nature.*

MILK AND OZONE.

HOW THUNDER-STORMS CAUSE SOUR MILK.

During electrical disturbances it seems that cream and milk are put into a condition to sour easily. The probable cause of this the editor of the *Cultivator* (Albany) explains as follows: The effect of an electrical discharge is to decompose a portion of the atmosphere, by which ozone is produced. This substance has peculiar properties from its intense activity as an oxide of oxygen, and its action is often believed to be, and may be, the cause of the souring of milk, beer and fresh wine during what are known as thunder-storms. The ozone is diffused through the air, and is believed to be the cause of the strong acid odor which prevails after the storm is passed. No doubt if the milk is submerged in water, and access of air is prevented, no result of the kind need be apprehended; and as the more milk is exposed to the air the more it will be affected by the ozone, the milk in open shallow pans will be acidified more readily than that in deep pails, although these may be open. In our long experience, however, the writer adds, we have never had any milk affected in this way, either in shallow pans or deep pails, and are of opinion that the heat of the air preceding thunder-storms is more directly the agent in the souring of the milk than the ozone that may exist in the air after the storm is passed. Carefulness to maintain a proper temperature, by closing dairy houses and cellars against the outer atmosphere, will be a means of safety.

RACE VICISSITUDES.—"It may come to pass," said a British lecturer lately, "that some African may, in centuries to come, point out how a race of Englishmen once dominated the West Indies, and were improved off the face of the land." Such fears are real enough. In 1658 there were in those islands 4,500 Europeans to 1,500 Africans. In 1800 the numbers were 30,000 Europeans and 300,000 Africans. In the last census the figures were 14,433 Europeans, 109,946 colored, or mulattoes, 444,186 Africans, and 12,240 Asiatics.

BUSINESS NOTES.

CANADIAN BARYTA.—The baryta deposits on McKellar's Island, Canada, are now being worked. Experts pronounce this to be the finest deposit in America.

BECOMING LIGHT.—A Berlin restaurant and cafe is cooled in summer and heated in winter by electricity, and the flood of light from the electric lamps is tinted a delicate pink, which is so becoming to the complexion of the lady visitors that the place is thronged.

MONSTER BUSH.—The trunk of a rose bush growing at Ventura, Cal., is said to be three feet in circumference, and the first branch it throws out is twenty-one inches in circumference. It runs over a lattice work, and though more than a wagon load of boughs have been removed, it covers a space of about 1,200 square feet It yields thousands of flowers and is fourteen years old.

FLIES AND CLOVER.—People in the country who are annoyed by flies should remember that clusters of the fragrant clover which grows ab_ndantly by nearly every roadside, if hung in the room and left to dry and shed its faint fragrant perfume through the air will drive away more flies than sticky saucers of molasses and other fly traps and fly-papers can ever collect.

VALUABLE PRIZE.—The Alvarenga Prize, of the College of Physicians of Philadelphia, consisting of one year's income of the bequest of the late Senor Alvarenga, of Lisbon, has been awarded to Dr. R. W. Philip, of the Victoria Dispensary for Consumption and Diseases of the Chest, Edinburgh, for his essay on Pulmonary Tuberculosis, which will be published by the college.

WINE AND SUNLIGHT.—Experiments recently made in Spain show that sunlight has an important action in maturing wines. Layers of new wine in bottles of colored glass have been exposed to the direct rays of the sun, with the result that both the flavor and quality have been improved. In the South of Europe there has been a practice of ripening cognac by exposing the bottles on the roof for years.

SOFT SNAP.—Stranger (to clerk in temperance hotel): "You don't seem to have any bar here?"

Clerk: "No, sir, but all our rooms are fitted with electric bells. You can go up to your room if you wish, sir, and have a Kodak drink."

Stranger: "A Kodak drink. What's that?"

Clerk: "You press the button; we do the rest."—*Lowell Citizen.*

CLEVELAND SUSTAINED.—Mrs. Miggs (reading the paper)—John, I don't believe that the *Sun* is really down on Mr. Cleveland as it pretends to be, do you?

Miggs—Yes, of course I do. What put such an idea as that into your head?

Mrs. Miggs—Well, I notice that it has been saying just as nice things about his baking powder as the *World* has.—*Jester.*

MINUTE WATCH.—A watchmaker in Newcastle, England, recently completed a set of three gold shirt studs, in one of which is a watch that keeps excellent time, the dial being only three-sixteenths of an inch in diameter. The three studs are connected by a strip of silver inside the shirt bosom, and the watch contained in the middle one is wound up by turning the stud above. The hands are set by turning the one below.

HYGIENE IN GERMANY.—During the past few years the subject of hygiene has received marked attention from the German Government. In nearly all the leading universities there are now hygienic institutes, thoroughly equipped in every way. Recently the new Hygienic Institute in the University of Halle was opened. The institute has a lecture room, and also special chemical, physical and bacteriological laboratories.

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CONTENTS.

ASTRONOMIC AID.

Prof. Edward C. Pickering of the Harvard College Astromomical Observatory, announces that Miss C. W. Bruce offers $6,000 during the present year in aiding astronomical research. No restriction will be made likely to limit the usefulness of this gift. In the hope of making it of the greatest benefit to science, the entire sum will be divided, and in general the amount devoted to a single object will not exceed $500. Precedence will be given to institutions and individuals whose work is already known through their publications; also to those cases which cannot otherwise be provided for, or where additional sums can be secured if a part of the cost is furnished. Applications are invited from astronomers of all countries, and should be made to Prof. Pickering before October 1, 1890, giving complete information regarding the desired objects.

A CENSUS OF MANUFACTURES.

Closely allied with and complementary to the forthcoming report of Commissioner Wright on the cost of production, to which the attention of the readers of the AMERICAN ANALYST has been called, is the compilation of manufacturing statistics, which the Superintendent of the Census is about to prepare in the cities and manufacturing towns of the country. In upwards of a thousand manufacturing places special agents have been designated to take the statistics of all manufactures which are not covered by expert inquiries. In these latter cases a single industry, like woolen manufactures, iron and steel, locomotive building, or glass works, has been placed in charge of a single individual, usually the secretary of some manufacturing association or some one formally engaged in the business. These experts have the assistance of special agents where they are needed, and under their direction blanks are sent to the leading manufacturers, as in the case of industries which are left wholly to the special agents, and to the chief of the Manufacturing Division in the Census Office. Different forms of blanks have been prepared for the leading manufacturing industries of the country, and a general form for the manufactures for which there are no special schedules. The same questions regarding the capital invested, the rentals, taxes and insurance, the number of operatives and their pay are embodied in all the schedules. It is when the agent comes to the questions of materials used, goods manufactured, and the power used in the manufacture that the schedules differ. The questions regarding the elements entering into the products and the goods manufactured have been carefully prepared in each case by persons familiar with the industry. In the case of agricultural implements, manufacturers are asked to specify the quantities and cost of the lumber, iron steel and different kinds of fuel which they use, and to state the number and value of over fifty different implements which they may make. In the case of paper mills the quantities and values of rags, waste paper, manila stock, straw, wood pulp, soda-wood fibre, and sulphite wood fibre must be stated, and the quantities of some forty different kinds of paper which may be sold. In the case of tanned leather, the manufacturer must state the cords of hemlock and oak bark, the barrels of hemlock bark extract, the hides tanned for different kinds of leather, and the goat and sheep skins tanned. He must also state the different articles used in currying. Under the head of chemicals and allied products, the manufacturer is asked to specify carefully the materials used, and some forty general classes of chemicals are mentioned under the heads of goods manufactured, with the additional request that any other goods be given in detail. The white ware and pottery schedule names nearly thirty materials which enter into the manufacture, the manufacturer being asked to specify the quantities and values of each used. The classification of the employes in this industry is elaborate enough to cover 168 different classes, forty-two being the names of different kinds of labor, and the multiples being the division into sexes and ages. There is a separate schedule for terra-cotta, sewer pipe, fire-brick and stone and earthenware. The schedule of cotton manufacturers includes elaborate sub-divisions of materials and goods produced and a careful statement of the machinery used. In every case both quantities and values of materials used are requested and the sub-divisions are minute enough to permit intelligent circulation. The hours of labor and the wages are also requested. These questions are more elaborate and have been more carefully prepared than in any former census, and the results will probably be published in more detail. It will be possible at an early date to present aggregates for different cities and towns, but the aggregates of industries will not be ready until all the returns are in. The total capital employed in each community in manufacturing will probably be set forth in the published volumes, but the more minute details will probably be given for only those cities which are largely engaged in particular industries. All the facts, however, will be on the schedules in the Census Office, and new calculations and compilations can be prepared if especially requested by Congress. The facts gathered will be numerous and in many senses complete.

UNHERALDED BENEFACTIONS.

The world is almost ignorant of the gratuitous services that scientific men are constantly rendering in its behalf. Every inventor whose name has been made prominent by its association with some single conspicuous discovery has brought forth other perhaps equally useful inventions for which he neither asked nor received any consideration other than the satisfaction of benefitting his fellow creatures. This was the case with Ericsson and is the case with Pasteur. The latter might probably have been the richest man in the world if he had cared for the commercial value of his discoveries and protected them by patents. In addition to his discoveries in the prevention of hydrophobia, he discovered the cause of a mysterious disease among silkworms, which threatened to destroy the silkworm industry in France, and applied a remedy. The wine growers of France and Italy complained of their vines being slow to mature and the grapes to turn sour. Pasteur's investigations of the yeast germs taught the grower how these evils could be cured. He discovered the microbe which propagates disease in sheep, and suggested, a remedy. These discoveries represent a gain to the community of many millions of dollars, but the great scientist has made no effort to profit personally from any of them.

HYPNOTIC RISKS.

Much has been said, but the subject is of too great importance to over-warn the public regarding it, of the risks attending the employment of hypnotism in the treatment of disease. Hypnotism unquestionably favors and develops tendencies to hysteria. Hysteria is a disease in which the higher cerebral activities are suspended, and this is a leading and essential characteristic of the hypnotic state. The Minister of War in France, in consequence of certain bad results, has forbidden military physicians to resort to hypnotism among the soldiers, from fear that hysteria might become prevalent in the army. The same proscription ought, with at least equal force, to apply to the practice of hypnotizing children, who may be made fools or crazy by the constant repetition of such practice. Gilles-de-la-Tourette declares that those that are hysterically predisposed are almost certainly made hysterical by frequent hypnotizing, and as for those already hysterical, if, by chance, one now and then succeeds in curing a paralysis or a contracture, it is only to make the disease locate itself elsewhere, or substitute for the contracture or paralysis a series of fits.—*Therap. Gazette.*

POLLUTED CROTON.

The New Aqueduct in its Relation to the Public Health.

PROTECT YOUR FAMILY'S HEALTH BY FILTERING THEIR DRINKING WATER.

The past week marked an important event in the history of the City of New York, in the first practical use of the new Croton Aqueduct, which is to be the main source of water supply to our metropolis for many years yet to come, and is already pouring a flood of 75,000,000 gallons daily of contaminated, impure water into our reservoirs, and the pestilent germs of disease in to our homes.

That the new aqueduct is a necessity to our city, an inestimable boon to our population, and the most stupendous engineering feat of the age, and a structure of which our citizens may justly feel the greatest pride, are self-evident propositions. But it is also equally indisputable that the incautious use for drinking purposes, without special purification or filtering, of this impure water, saturated as it is with the dangerous contaminations of the new aqueduct, as well as those of the Croton Lake, will for many months, if not years to come, prove a source of disease, a menace to health, and a prime factor in the mortality and vital statistics of New York City.

Probably almost every one who has had occasion to use Croton water since the flow through the new aqueduct commenced has noticed and commented on its filthy, unpalatable appearance, but in the majority of cases have considered it but a temporary annoyance due to the first use of the aqueduct, and which would cease when the water "cleared."

This, however, is erroneous, for, while it is true that the water will become less discolored, and in time colorless, yet the poisonous saturations, the fungi and bacteria will still remain, and nothing but distillation or filtration will remove them; and in this connection we quote from the issue of September 1, 1886, of the AMERICAN ANALYST as follows:

"With the increase in population in the neighborhood of the great cities, there is an increased fouling of the water supply. The Croton, Ridgewood, Cochituate and other great waters of the Eastern States have lost nearly all of the purity and sweetness which at one time made them famous. So great is this change for the worse that at times the Croton is positively unpotable, being a mass of dirt, filth and decaying organic matter. This change has made filters an ever-growing necessity. This necessity cannot be too loudly preached to the American public. IT IS AS GREAT IN MID-WINTER as in the dog-days. It involves the health and life of the grown, and more especially of the little folks. One-third of the cholera infantum and kindred maladies which are so great a cause of the awful infant mortality of the land is due to their unhealthful water supply. Every housekeeper should use a filter unceasingly."

About the same date Dr. Edson, of the New York Board of Health, speaking of impure water, says:

"We do not fear that which our senses feel and warn us against, though cleanliness, coolness and seeming purity of water are by no means proofs that the deadly baccilia, more to be feared than venemous serpents, do not lie hidden in the sparkling fluid."

Later on, in 1878, the statistics of the sources of some of the impurities of Croton are given as follows:

"At a recent meeting of the Medical Society of the County of New York, Dr. John C. Peters read a paper on "The Water Supply from the Croton Lake System," in which he stated that the sewage created by 25,000 people, the largest condensed milk factory in the world, 10,000 cows, 1,200 horses, 1,500 hogs, and 40 factories, was all being run into that body of water from which New York draws its water supply. While in former years the Thames water used by London contained five times as much bacteria as Croton water, recent investigations showed that in one cubic centimetre New York water contained 526 bacteria, against 44 contained by London water. While of course the greater part of these were the common, harmless bacteria, still there was a large proportion capable of producing disease; and he expressed the opinion that a great deal of the scarlet-fever, diphtheria, and other infectious diseases which prevailed in New York, might be traceable to germs derived from the water supply."

If the reader has any remaining doubts as to the absolute necessity of filtering Croton water before using it for drinking and culinary purposes, the following graphic description of its impurities from the pen of John Michels, Esq., the well-known microscopist, will for ever set them at rest. Dr. Michel says:

"To one who has for many years examined with the microscope the water supply of New York City, it appears incredible that persons can be found who are willing to take into their systems the abominations and filth which is all the time present in the water. Look on the accompanying page, where will be found but a sample of the living animal life taken from the Croton water; they are, indeed, numerous enough to stock a Lilliputian menagerie, but, after all, they form but a small part of those to be actually seen. The water swarms with such life, to which must be added the vegetable forms which are almost as numerous and interesting. Finally there are the millions of bacteria and infusoria whose numbers are limitless. Such things are objectionable enough when living, but they die and rot like larger animals, and often by change of temperature, in such immense numbers, as to charge the drinking water with sulphureted hydrogen; this causes the offensive putrid odor, so often noticed in Croton water during the summer. Then again, on the banks of the lakes, in which the water is stored, there abounds masses of weeds of all descriptions; they die in due season and rot. In this condition the decayed vegetable matter passes into our water supply and being comminuted by friction in the pipes, appears in the minute, tiny particles, which can be seen floating in every glass of water. People who hold up to the light a glass of Croton water, which looks bright and good with this innocent looking fine sediment, little think that when the sediment is accumulated in bulk, it has the color of tobacco juice and a sickening odor as repulsive as filth can make it. Who would eat such a mass of contaminations when seen in bulk? Then, why drink it in small quanities in every glass of water you use? Typhoid fever lurks in every particle of this deposit, and the smallest homeopathic doses are capable of carrying contagion."

The effects upon the city's health of the masses of impure water daily discharged into our reservoirs is not of merely temporary or transient danger, for the increased force or head of the new supply has carried the masses of contaminated filth with which it is laden to every reservoir, tank, and place of storage supply in the city, where it will lay breeding disease and fresh contamination to every drop of water daily brought in contact with it for months yet to come. This would seem trouble enough when we take into account that typhoid, malarial and scarlet fevers, cholera, diarrhœa, and other zymotic diseases are chiefly caused by drinking *unfiltered*, impure water. But this is but the beginning of the dangers of our water supply of the future, for with the use of each of the new storage reservoirs, the Quaker Dam, etc., which are relied upon for our increased water supply, comes increased risk of malarial and zymotic disease to New York.

The enormous and constantly increasing sale in New York of the various natural and artificial spring, and distilled or carbonated waters, is mainly due to the impurities of the Croton and the demand for a substitute for it by those who can afford to pay the price. And for the past ten years a large contingent of our most intelligent resident population have habitually filtered all water used for drinking purposes. But to the great majority of our population, water is water, and its purification an unknown quantity.

The present dangerous and alarming condition of our water demands prompt action on the part of every householder, family, and user of Croton water. The impurification of the Croton is cheaper than doctors' bills. Fortunately, Croton water contains no deleterious mineral impregnations requiring elimination, and its purification can be effected by either of two simple mechanical processes—distillation or filtration, Distillation, from the nature of the process, is impracticable for general family use; so that filtration is the one and only resource available to the masses of our population for the purification of our water. Nature furnishes the highest, most perfect form of filtration in the process of the percolation of foul surface water through underground strata of porous stone, and its delivery pure and limpid at the spring. Therefore the more nearly we can imitate nature in our filter, the simpler it will be and the greater our success; and here Nature teaches us another lesson in filtration in the form of mineral springs, where the waters in the course of their percolations through the earth have come through metallic ore bearing rock, in which case the water at the spring will be minerally impregnated instead of pure. Consequently, if you desire pure water avoid metal as much as possible in the construction of whatever filter you use. But at all events filter your drinking water, some way or other. Buy a good, simple filter, and save health and doctors bills; but if you cannot or will not buy an effective filter, at least tie a piece of clean flannel over your faucet, and strain out, if you don't filter out at least a portion of the horrible impurities contained in our Croton water.

The following are the absolute essentials of a good filter:

1. That every part of the filter shall be easily gotten at for the purpose of cleansing.
2. That the medium be an efficient purifier, and permit the water to pass slowly, otherwise it is only an attempt at filtering.
3. That the purifying medium shall not receive into its pores the filth it extracts.
4. That the filtering medium and the whole construction of the filter shall be lasting, and require no change of substance or condition.
5. That metal must not be used in the construction of a filter, as it is always bad and nearly always poisonous.
6. When ice is used, it must have a separate ice chamber, to keep the ice and its disease germs from the filtered water.

ORIGIN OF FLIES.—The cyclone makes the house fly, the blacksmith makes the fire fly, the carpenter makes the saw fly, the driver makes the horse fly, the grocer makes the sand fly, the boarder makes the butter fly; and if that is not enough for you, you will have to pursue your future studies in entomology alone.

GILT RESTORER.—Gilt picture frames may be brightened by taking sufficient flour of sulphur to give a golden tinge to about one and one-half pints of water, and in this boil four or five bruised onions, or garlic, which will answer the same purpose. Strain off this liquid, and with it, when cold, wash with a soft brush any gilding which requires renewing, and when dry it will come out bright as now.

ÆSTHETICS OF SMOKING.

THE TRUE INWARDNESS OF TOBACCO ENJOYMENT.

Almost all men smoke with their eyes, though few of them know it. They do not light the cigar with their eyes, though often poems refer to eyes, usually some girl's, as bright enough for that purpose; but the real enjoyment of smoking comes through the eyes and the touch. It seems to be commonly thought that the senses of taste and smell are those which are most affected by tobacco and those which alone make a man enjoy tobacco, but this is not correct. Of course, a man may taste a cigar just as he may taste a piece of leather or a piece of wood, but unless he chews, the taste of tobacco is no more pleasing than the taste of leather or wood; rather, on the contrary, it is sickening. Then, men think they can tell about cigars from their odor, but in reality they tell about them from their appearance and their feel. There are many men who hold a cigar in their mouth and roll it around without smoking it. Some of them bite it and others chew it, but the number who hold it between their teeth or roll it around between their lips is greater. That is usually the way with an old smoker. When the cigar is lighted he has a certain particular place for it, and certain teeth between which the cigar rests. With some men it is the front teeth, with others the incisors, and some men shift their cigar away back. It is seldom that two men hold their cigars in their mouths in just the same way and at the same angle. There are as many ways and angles of holding cigars as there are men who smoke them. There is where a great deal of the satisfaction of smoking comes in. The nerves of touch of the lips are as keen and sensitive as of any part of the body; there is no hard cuticle to dull them. The lips are full of sensitive blood vessels and sensitive nerves, they curve, arch, straighten, become hard, are drawn, and conform to every motion of the mind and to every thought. Most smokers have mobile lips. The hard-mouthed man seldom becomes a victim of the smoking habit. He may smoke occasionally because others do, or he may chew, but he misses one of the greatest enjoyments of a cigar. These blood vessels and these nerves in the lips are near the brain. The contact of the cigar with them goes at once to the brain. That feeling and the sight of the smoke are soothing; it is not the taste and the smell. One of the greatest differences between good and poor cigars is in the wrapper. It is the wrapper which comes in contact with the lips. A good wrapper is soft, softer than velvet or down; it is like flossy silk. It does not feel this way to the palm of the hand nor when clenched tightly between the lips, but when held between the teeth, the lips touching it and caressing it like an imprinted kiss. To a greater extent does smoking appeal to the eyes. Try to smoke in a dark room and the enjoyment at once decreases, and it is hard to tell the difference between a good and a bad cigar. It is hard even for a man who is accustomed to smoking to tell whether his cigar is lit or not, except by looking at the coal on the end. If the man keeps his eyes closed and does not see the coal, it is easy to deceive him. This would not apply to a man who had never smoked before, but to a man who is accustomed to smoking—and to such alone are the joys of the smoker. A sight of the smoke and the cigar is necessary. It is the smoke and the glow which appeal to the eye; the contrast between the different shades of brown in the cigar, the cherry of the burning tobacco and the grayish ash, with the thinner gray of the smoke, changing into various shades of blue and gray as it goes through the air—it is these that make the visions, the quiet and the placidity which are the charms of smoking. The fact that a cigar appeals both to the touch and sight accounts for the difference in the sensation of smoking a pipe, a cigar, and a cigarrette. The touch of each of the three is different. The same tobacco may be in the pipe and in the cigar which is in the cigarette, but it does not smoke the same way, and it does not have the same effect on the smoker. There is not the same feeling to the lips and there is not the same appeal to the touch nerves. Both the sight and the touch of a cigarette are so different that it cannot be considered with a pipe or a cigar. There are several lessons to be learned from these facts about smoking, which are clear to every one as soon as he thinks about them, but which most smokers have not thought about, as they go on enjoying their habit without reflecting about the reasons for the enjoyment. One of them is that a cigar should be chosen and smoked in a deliberate, thoughtful, and philosophical way. A cigar is more than a brown roll of tobacco. Simply as that it may bring profit to the dealer and enjoyment to the eye through its symmetry and color, but its force is potential It has to be burned to have the enjoyment it contains let loose. A smoker should always look at the cigar first. Cigar dealers have appealed to this in arranging their boxes open in glass cases. So far as the factory, the size, shape, quality, price, brand, color and grade go, the cigars might as well be kept in closed boxes. They would also keep better that way. A smoker should look over the case; he should look over cigar after cigar until some particular cigar appeals to him. It is the same way with a box. No two cigars are alike. There is a little speck or spot on one, there is a litte tear of the cover, a little different twist to the end, a little change in the convolutions of the filler, the binder and the wrapper as they are exposed to view before the match is applied. Notice these little points in cigars and pick out one that has some little point that you particularly notice. Some men prefer cigars with yellow spots, others prefer a hard-looking cigar, others a loose cigar, and so on. The preference is not material, the pleasing of the eye is. When a selection satisfactory to the eye has been made, the start at least to a good smoke is assured. Always look at the cigar before lighting it. Turn it around in your fingers and look at it. It is going to give you pleasure. Then light it, not by sticking it in a flame, or by poking it in a small globe, but by lighting a piece of paper, stick or match, and holding it up. Do not put the cigar in your mouth and poke your face into a flame. That prevents the eyes from watching properly what is going on; but take a light and notice the flame as it goes to the cigar. The smoke begins to curl before the eyes, the lips fit around the cigar like a mould. Then an enjoyable smoke has begun.

ARTIFICIAL EMERALDS.

THE MANUFACTURE OF PRECIOUS STONES FROM GAS RETORT REFUSE.

Owners of precious stones were surprised a short time since by the announcement that a method of producing artificial emeralds and other gems from the refuse of gas retorts had been discovered by Mr. Greville Williams, F. R. S., the Chemist of the Gaslight and Coke Company, London. According to a contemporary, the gem which Mr. Williams has modeled is composed of about 67 to 68 per cent. of silica, 15 to 18 per cent. of alumina, 12 to 14 per cent. of glucina, and minute proportions of magnesia, carbon and carbonate of lime. The intensely green color for which the jewel is valued is believed to be due to a slight dash of sesquioxide of chromium, though this tint has by some chemists been attributed to vegetable matter—the analyst having to proceed warily when dealing with such costly stuffs as diamonds and emeralds. It may, therefore, be presumed that Mr. Williams has turned out his artificial emerald by skillful fusing and crystalization of these ingredients. It seems, however, that there is nothing very new in the artificial production of precious stones—these having been made upwards of sixty years ago. In 1837 Gaudin produced rubies by heating ammonia, alum and potash by means of the oxy-hydrogen blow-pipe; the intense heat developed by this apparatus volatilizing the potash and the alumina, then crystallizing in rhombohedral forms identical with those of the natural stone, and having the same specific gravity and hardness. The artificial production of precious stones is interesting from the standpoint of the chemist and mineralogist, and in the present case the gas manufacturer may be included; but the cost entailed is too great to allow of the operation being a commercial success, and therefore the dealers in these adornments will probably not have to close their shops as the result of Mr. Williams' discovery.

HARD ON THE DOCTORS.

A PLEA AGAINST ABRIDGMENTS OF INDUSTRIAL LIBERTY.

That the members of a particular profession should have laws passed in their special interest, and should be empowered to decide who may and who may not enter into competition with them, is, we think, a violation at once of justice and of liberty. The worst of these things is that a public motive is always alleged for what is in the main, if not, exclusively, the outcome of private greed or jealousy. It would scarcely be too much to say that the most offensive forms of trade-unionism are found in connection with the so-called learned professions. Time was when it was supposed that the state had to look after the spiritual health of individuals; and for that purpose to prescribe their theological beliefs and religious observances. That belief has for the most part been exploded in the modern world, but its place has been taken by the notion that the state is responsible for the intellectual health of its members; and in lieu of the state church we have state schools. As regards the physical health of the community, the general method is to legalize one or two—possibly quite conflicting—schools of medicine, and to empower them to rule out, and if necessary to prosecute and punish all others. Nobody, broadly speaking, seems to believe that, in the absence of all legislation of this character, people could in any adequate manner preserve their health or protect themselves against gross imposture. We believe it—believe it most heartily; and we believe that the science of medicine would advance far more rapidly, and that, on the whole, the public health would be far better, if every man were left perfectly free to employ any one he chose to attend him in sickness. At present every licensed practitioner feels himself authorized to call every unlicensed practitioner a quack. We should prefer a system under which, to a quickening public intelligence in questions of health and disease, the quack should stand revealed by his quackery. How much of real quackery is now concealed by the license to practice it might distress a confiding public to know.—*Popular Science Monthly*

Cooking by Electricity.—A most novel experience was that of boiling eggs and cooking beefsteak by electricity, successfully performed recently in Cincinnati. It required six amperes and 96 volts to produce sufficient heat. The apparatus used in these experiments was a resistance formed by platinum wires insulated from each other, and so arranged that the heat was concentrated at one point and kept from radiating by an iron box or oven, lined with mica and asbestos.

Warm New York.—On a recent warm day a single uptown ice cream store on Ninth Avenue, near Seventy-second Street, sent out to customers 1,380 quarts of frozen sweetness in addition to the quantity supplied to customers in the store. Fruits and frozen cream are undoubtedly the staples of midsummer merchandise in this city. Soda water, which is closely affiliated with them both, comes next in public favor.

World's Power.—The mechanical horse-power of the world is equal to 100,000,000 men, or more than double the working population of the earth.

LATENT HEAT.

WHAT IS IT, AND WHERE IS IT DEPOSITED?

The phenomena of latent heat were first investigated by Dr. Black, of Edinburgh, nearly 130 years ago. He was first attracted to the subject by noting that it was impossible to raise the temperature of ice until it was all melted. For instance, if a pound of ice is put over a spirit lamp, a large quantity of heat passes into the ice, but the mixture of ice and water shows no tendency to rise in temperature until all the ice has disappeared. The question then was what became of the heat. It was proved that the heat was used to melt the ice, but where did it all go to? It had disappeared and was unaccounted for. Another experiment was tried in which a pound weight of water at 100 deg. C. and a pound of water of 0 deg. C. were mixed, and the result was two pounds of water at 50 deg. C. In the mixture the pound of boiling water gave up 50 deg., reducing its temperature one-half, and the cold water receiving it is raised to 50 deg. But if instead a pound of water at 100 deg. C. and a pound of ice at 0 deg. be mixed, we have two pounds at the same temperature, but the mixture, when the ice is melted, would show but about 10 deg. C. instead of 50 deg. Thus it would appear that 80 units of heat had disappeared and were unaccounted for. The experiment was then tried, from which it was found that this 80 units of heat reappeared when water was converted back again to ice, and this heat was manifest and given to the surrounding bodies. The question was: Where does this heat go to and where does it come from when it reappears? Dr. Black answered that heat was a kind of matter, a subtile and elastic fluid, and water had a great capacity for holding this fluid. Between the molecules of the water, it was said, there are minute spaces into which the heat finds its way, and there lies hidden as long as the water remains in the liquid state. In this condition the heat produces no sensible effect on the thermometer. But no sooner does the water begin to pass back into the solid form of ice than this heat is forced to come out from its lurking place and to make itself sensible once again. This was the doctrine that prevailed down to the close of the last century. The same action is seen in making steam, for if heat be applied to water, the temperature will rise until the boiling point is reached, and if the steam formed is allowed to escape, the water will show no higher temperature, though heat is being constantly added. This heat, it was said, was concealed between the particles of the vapor, and was squeezed out again when the vapor was changed back to water. This is what is known to-day as latent heat, just as it was called by Dr. Black, and the point for the engineer to remember is that in making steam 966 of the units of heat required to make a pound of steam at atmospheric pressure disappear and have no effect on the thermometer; also that when the steam is condensed, this heat reappears and is sensibly felt, hence is not lost. But although it has disappeared, the modern theory of heat as a kind of motion does not allow this idea that it is hidden somewhere and can be found by shaking. According to the modern theory of heat, when we add heat to a mass, we do not pour into it a certain quantity of matter, but we impart to it a certain amount of energy. This energy goes to pull asunder the molecules of the ice against the molecular action that tends to keep them locked together in solid form. In overcoming these forces the heat expends itself, and ceases to exist as heat. Hence the term latent heat is hardly applicable. To make this theory clear, assume two blocks of lead suspended by two strings from one point. Under the influence of gravity each tends to place itself vertically below the point of suspension, and thus they cling together with a certain small force. If we wish to pull them asunder, we must overcome the force that is pulling them together, and in doing so expend a certain amount of muscular energy. If we allow the blocks to go, they will fall together and acquire an energy of motion equal to that expended in separating them. In the transformation of ice to water, and water to steam, this same process is seen, for the particles cling together and resist separation. Heat is the agent by which we overcome this attraction, and in doing so it expends its energy until all the particles are separated and the block of ice becomes the liquid water or the liquid water the vapor steam. The heat has disappeared as heat and has become energy. Hence the term latent heat is not applicable in a strict sense. It is applicable to this extent, that as the particles of water and steam are held apart they possess a certain amount of energy of motion which will cease when the particles come again in collision, and be converted into the energy of heat. It was so with the two blocks of lead on a large scale, and exactly the same on an indefinitely smaller scale in the conversion of water to ice and steam to water. The energy of motion of the steam is changed into heat by condensation. Hence all the heat that disappears to separate the particles of the water to make steam is given up and becomes sensible when the steam is condensed and becomes water. This heat disappearing and appearing again is what is know as latent heat, yet our engineer friends will understand that when it has disappeared to make steam it is no longer heat that can be shaken up and driven out of its hiding place, but energy which can be converted into heat again by condensing the steam. It is this fact that makes steam such an efficient vehicle of heat, because in condensing it so much heat is produced in its change of form. It is put into the boiler and carried in the steam as energy, but all is given up again. Therefore there is no loss.

AN IMPROBABLE RISK.

THE INFREQUENCY OF DEATHS BY LIGHTNING.

It is probably idle to tell people that there is a thousand times the danger in the sewer pipes that there is in the thunder clouds, but it is true all the same. The deaths by lightning are few indeed. Who of the readers of this paragraph, says the Hartford *Courant*, ever lost a friend that way? Who of them hasn't lost a score of friends by the less brilliant and less noisy destruction that comes up out of the drains? The trouble with the lightning, or the trouble that it gives the people, is in its indescribable suddenness and its absolute uncertainity. You know neither when it is coming nor where it is going, all you feel certain about is that some storms leave a number of catastrophes to mark their course. The caprice of the lightning defies the explanations of science, and there is no predicting beyond a few generalties. This much it does seem safe to repeat, even in a lively lightning season, that the increased use of electricity, with the multiplicity of wires, has tended to fewer fatal strokes of lightening in cities.

AMMONIA.

ITS SOURCE, MANUFACTURE AND DOMESTIC UTILITY.

According to the *Scientific American* of July 12, the wholesale price of concentrated liquid ammonia has recently advanced from 5¼ cents a pound to 9 cents, and at this writing it is extremely difficult to get enough to supply the demand even at that price. The immediate cause of this great advance in price is due to the unexpectedly large orders from the manufacturers of artificial ice, which have been received during the last few weeks. The ammonia which is used in ice making is obtained from what is known as gas liquor, and is produced in the process of carbonization of coal in gas manufacturing. At this season of the year only about forty per cent. of the amount of gas liquor is to be had which is available in the winter season, owing to the decreased consumption of gas in summer. The laws of several States require gas companies to remove the ammonia from their product, as it greatly improves its quality, but it has only been within recent years that the element thus obtained has been utilized for the production of refined ammonia, which is now in such great demand that manufacturers find themselves totally unable to supply it. Still another cause exists for the scarcity of ammonia, and that is the changing of a large number of companies from the carbonization of coal in the production of illuminating gas to the making of what is known as water gas. In the latter process no ammoniacal liquor is produced, and thus a productive source of supply of the raw material for the manufacture of concentrated ammonia has been entirely cut off. Very ingenious machinery is used in extracting the ammoniacal liquor from the gas, and the former is then disposed of to chemical companies, who subject it to a special course of treatment to prepare it for general use. Sulphate of ammonia is produced by the carbonization of a bone and animal matter, but this product is generally employed as a fertilizer. Aqua ammonia has been made from the salt, but not to any great extent, and it so happens that the supply of the sulphate is short, even in foreign lands, where manufacturers have vainly attempted to supply themselves with the much coveted article. Ammonia, also familiarly known as hartshorn, is said to be one of the few substances known to the chemistry of the ancients, being referred to by Pliny under the name of vehement odor, which he evolved by mixing lime with nitrum, or what was probably sal ammoniac. The name ammonia was given in ancient times because of the fact that sal ammoniac was originally obtained by heating camel's dung in Lybia near the temple of Jupiter Ammon. Ice manufacturers say that some other source of supply must be found for crude ammonia, as the demand from the producers of artificial ice will greatly increase. It is said that ammonia can be obtained in large quantities from shale, which is a kind of slate found in Pennsylvania, specimens of which are sometimes found mixed with coal. It is claimed, however, by those who are usually depended upon to supply concentrated ammonia, that with a winter supply of gas they will have little difficulty in meeting the demand, which is wholly phenomenal at this time, owing to the large number of ice-making machines which have recently been set up. In connection with the subject the readers of the AMERICAN ANALYST will perhaps be interested in the following partial enumeration of the domestic uses of ammonia. A little ammonia in tepid water will soften and cleanse the skin. Spirits of ammonia will often relieve a severe headache. Door plates should be cleansed by rubbing with a cloth wet in ammonia and water. If the color has been taken out of silks by fruit stains, ammonia will usually restore the color. To brighten carpets, wipe them with warm water in which has been poured a few drops of ammonia. One or two tablespoonfuls of ammonia added to a pail of water will clean windows better than soap. A few drops in a cupful of warm water, applied carefully, will remove spots from paintings and chromos. Grease spots may be taken out with weak ammonia in water; lay soft white paper over, and iron with a hot iron. When acid of any kind gets on clothing, spirits of ammonia will kill it. Apply chloroform to restore the color. Keep nickel, silver ornaments, and mounts bright by rubbing with woolen cloth saturated in spirits of ammonia. Old brass may be cleaned to look like new by pouring strong ammonia on it, and scrubbing with a scrub brush; rinse in clear water. A tablespoonful of ammonia in a gallon of warm water will often restore colors in carpets; it will also remove whitewash from them. Yellow stains left by sewing machine oil, on white, may be removed by rubbing the spot with a cloth wet with ammonia, before washing with soap. Equal parts of ammonia and turpentine will take paint out of clothing, even if it be hard and dry. Saturate the spot as often as neces-

sary, and wash out in soap suds. Put a teaspoonful of ammonia in a quart of water, wash your brushes and combs in this, and all grease and dirt will disappear. Rinse, shake, and dry in the sun or by the fire. If those who perspire freely would use a little ammonia in the water they bathe in every day, it would keep their flesh clean and sweet, doing away with any disagreeable odor. Flannels and blankets may be soaked in a pail of water containing one tablespoonful of ammonia and a little suds. Rub as little as possible, and they will be white and clean and will not shrink. One teaspoonful of ammonia to a teacupful of water will clean gold or silver jewelry; a few drops of clear aqua ammonia rubbed on the under side of diamonds will clean them immediately, making them very brilliant.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

July.

Game and Poultry.—Pigeon, chicken, duck.

Meats.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal.

Fruits.—Cherries, strawberries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple.

Vegetables.—Beans, cucumbers, carrots, cauliflower, egg-plant, lettuce, onions, parsley, parsnips, potatoes, shallots, spinach, turnips, radish, rhubarb, corn, beets.

Fish.—Anchovy, bass, bluefish, blackfish, cod, eels, clams, flounder, haddock, halibut, herring, lobster, mackerel, mussels, perch, porgie, prawn, salmon, shad, turtle, trout, sturgeon, whiting, weak-fish.

PRACTICAL RECIPES.

Devilled Crabs.—Cook your crabs and take out the meat; put the shells and bony bits in a bowl and over them pour hot water, enough to cover them; add to the crab-meat a little onion, some cracker crumbs, pepper (black and red); salt, butter, and a little mustard; beat well; add a mixture of the hot water from the shells and sweet cream, using half and half; sufficient to make the meat quite moist. Fill the crab shells; sift powdered crackers over the tops, put on each a bit of butter and bake till brown, when serve at once.

Curried Veal.—Cut three pounds of veal into small pieces and boil until tender, in slightly salted water. Slice a large onion and fry it slightly in three large tablespoonfuls of butter; put in the veal and fry for a few moments; grate five or six apples and add them to the meat, also two tablespoonfuls curry powder and the broth in which the meat was boiled; simmer for half an hour, thicken the gravy and serve with boiled rice.

Vegetable Cutlets.—Take one cup each of boiled carrots, cabbage and potatoes; chop them fine; season highly with pepper and salt; add one beaten egg; form into cutlet shapes, dip them in flour and fry in boiling lard.

Baked Bluefish, Maderia Sauce.—Split your fish, wash it and remove the bones, cut it into small pieces; chop up two or three onions, a large handful of parsley, and cut a lemon into very small bits; sprinkle a plentiful handful of flour into your baking pan, over this a sprinkle of lemon, onion and parsley, pepper and salt; now lay the pieces of fish in this, sprinkle again with pepper and salt, parsley, and onion. Take a can of tomatoes, mash them through a colander, make it about a quart with the addition of stock, pour this over the fish, sprinkle again with flour; put bits of butter over it and another sprinkle of lemon, a few spoonfuls of vinegar, and bake brown.

Fruit Salad.—Pare, core and slice a ripe pineapple. Pile it in the centre of a glass dish in as nearly its shape as possible, divide four oranges into pieces, remove the seeds, and arrange them around the pineapple; cut four fine bananas into lengthwise pieces and arrange them around the oranges; add a few grapes of mixed colors. Make a cup of clear sugar syrup and to it add half an ounce each of brandy, maraschino and curaço; pour over the fruit and serve.

Raspberry Jelly.—Make a lemon or wine jelly; when nearly cold add some fine raspberries and pour it into a mould, or small individual moulds. Let it stiffen and serve with whipped cream or a rich syrup made of raspberries; serve very cold.

Recipe for Cooking a Ham Whole.—Boil the ham until done, then remove it from the boiler, and when cool enough to handle remove the skin, sprinkle with granulated or powdered sugar; place in a baking pan, and gently bake until slightly brown.

COUNTRY HOTELS.

Of the myriads, who every year leave the city and spend the summer in the country, how many secure the health and pleasure for which they go? The late Doctor Thomas Bayliss—a famous family physician—estimated that two-thirds of these summer-boarders would have been better off physically if they had remained at home.

The reasons of this odd fact are obvious upon the least reflection. The water supply of country hotels and boarding houses is seldom looked after by competent men, much less engineers, but taken haphazard from the most convenient source. This is usually a well or spring in the immediate vicinity of the dwelling-place. The soil is more or less porous and allows the percolation of the surface sewage into lower strata and thence into the well. Out of hundreds of well-waters analysed by the United States authorities, scarcely ten per cent. were of medium, much less first quality. Decaying organic matter in the immediate neighborhood is another cause of sickness and suffering. Sometimes it is occasioned by a swamp or marsh on the surface of the ground; sometimes by a piece of marshy land that has been partially drained and has become dry on the surface. Pig-pens, barn-yards, stables, muck-heaps, and out-houses are frequent sources of contamination in the same manner. Impure water and decaying matter are pernicious in more respects than one. Besides the dangerous gases, vapors, and liquids which they carry, they almost invariably are the vehicles, or breeding places of disease germs. A few years ago an epidemic swept away half the population of a small town in Pennsylvania. The cause remained undetected by the physicians of the place until the drinking-water was analyzed. It was then found that by reason of a preceding drought, the water supply was being taken from strata where there was a large amount of slow decomposition, and that the liquid contained decaying substances and any number of deadly microbes. On another occasion, a typhoid diarrhœa broke out in a popular hotel near Pine Hill, in the Catskills. A careful investigation showed that the layers of soil sloped from the out-houses in the rear of the building to the well from which all the water used in the place was drawn. The well was closed and a new supply of water taken from a spring far back in the hills. The disease immediately abated and disappeared. In nearly all instances, the injury is inflicted through the blood. Unhealthful gases and vapors are inhaled into the lungs and there absorbed directly into the blood-vessels through the walls of the cells. Water containing poisonous compounds is drunk and carries its contents directly to the assimilative tissues, which in turn transfer them to the veins Germs enter the system through the mucous membranes of the interior of the body and attack or affect the blood in short order. The first results are a change in the complexion, a loss of appetite, or a feeling of utter lassitude. Nature then endeavors to expel these foreign elements and does it in the form of fever, dysentery, ague, bilious headache, kidney disorders, dyspepsia, and a hundred other ways. All these methods are painful, dangerous, and at times fatal. It is easy, however, to assist nature and make the return to health easy and agreeable. All that is requisite is to expel these morbid elements from the system. Aperients and cathartics may, at times, be of benefit; but these affect only the stomach, liver, and intestines, and never reach the deep-seated tissues of the organization. The only substances which will produce the desired results in the best manner are podophyllin, Honduras sarsaparilla, stillingia, yellow dock, and the iodides. These, scientifically combined, constitute the finest blood-purifier known to the medical world. The highest development of this health-giving combination is the famous Ayer's Sarsaparilla. This medicine owes its excellence to the purity of its materials, the freshness of the vegetable elements from which the medicinal principles are extracted, the superiority of the scientific processes used, and the notable skill of the chemical experts employed. Thus, while any pharmacist can make a compound sarsaparilla, it is practically impossible to make one equal to Ayer's. These facts are so well known to the faculty that there is scarcely a physician to-day in Christendom who does not prescribe Ayer's Sarsaparilla in all cases where the blood requires purification. The same facts recommend it as an indispensable adjunct to every one who spends a summer in the country.

BUSINESS NOTES.

THE GATE CITY NATURAL STONE FILTER.

The Gate City Filter is simply a receiver and an accumulator made of earthenware of elegant design, having between the two departments a thin section of a natural rock, forming the base of the receiver. In use it is merely necessary to fill the upper portion or receiver with water, when it will filter through the material, and find its way to the lower portion or accumulator, as a perfectly purified water ready for use. Pasteur appears to have formed the same idea when he made his well-known filter, but he substituted an artificial earthenware filter in the shape of a tube; the principle, however, is identical in both, the advantages being on the side of the Gate City Filter in being a more natural and simple method, more rapid in action on account of the larger surface, and easier to clean.

Fastest Mile.—The fastest mile a single man has traveled by various methods of location is to date respectively recorded as follows: Swimming, 26.52; walking, 6.23; snew shoes, 5 39$\frac{3}{4}$; rowing, 5 01: running, 4.12$\frac{1}{2}$; tricycle, 2.49$\frac{2}{5}$; bicycle, 2.29$\frac{4}{5}$; skating, 2.12$\frac{3}{5}$; trotting horse, 2.08$\frac{3}{4}$; running horse, 1.39$\frac{3}{4}$; railroad train, 40$\frac{1}{4}$ seconds. Balloon, pneumatic tube and electricity records are yet to be made.

Measuring Thought.—A German scientific man has been making experiments with people's powers of thinking. By the use of two instruments, which he calls the neomatachograph and the noernatachometer, he promises some important results. His experiments show that it takes the brain 1.067 of a second to elaborate a single idea. This is undoubtedly a slow brain. Quick wits are different to deal with, and the philosopher recognizes this. He thinks that the time will come when we can all be able to test people's mental calibre by aid of his little machines. They would prove useful in a civil service examination.

American Cities.—In 1880, there were twenty cities in the United States of 100,000 population and upwards. This year twenty-seven have been reported exceeding 100,000. The cities above 200,000 are as follows: New York, Chicago, Philadelphia, Brooklyn, Boston, St. Louis, Baltimore, Cincinnati, San Francisco, Pittsburg, Buffalo, Cleveland, New Orleans, Milwaukee, Washington. Eight cities are reported above 300,000 this year, viz.: New York, Chicago, Philadelphia, Brooklyn, Boston, St. Louis, Baltimore and Cincinnati. San Francisco is set down as exactly 300,000. The 27 cities have one-tenth of the population of the whole country.

SEALED OYSTERS.—There is a new and ingenious device for keeping oysters good in the shell for several weeks after they have been taken from the water. Hitherto this has been done unsatisfactorily by boring holes through the edges of the shells and locking in the oysters with bits of twisted wire. By the new scheme the edges of the shells are dipped into plaster of Paris mixed with certain chemicals that make it harden quickly. In a few minutes the oyster is hermetically sealed, and so strong is the cement that not even the most muscular mollusk can manage to get a breath of fresh air after having been subjected to this process.

CUTTING GLASS BY ELECTRICITY.—The process of cutting glass tubes by electricity appears to be successful. The tube is surrounded with fine wires, and the extremities of the latter are put in communication with a source of electricity, it being necessary that the wire adhere closely to the glass. When a current is passed through the wire, the latter becomes red hot, heating the glass beneath it, and a single drop of water deposited on the heated place will cause a clean breakage of the glass at that point. Contrary to what takes place in the usual processes of treating this material, it is found that the thicker the sides of the tubes are the more successful is the operation likely to be.

WOODEN MIRRORS.—Wood brought to a mirror polish is coming into use for ornamental purposes in Germany, and has this advantage, that, unlike metal, it is not affected by moisture. The stuff is first treated with a bath of caustic alkali for two or three days, at a temperature between 164 deg. and 197 deg Fahr. Next comes a dip in hydrosulphate of calcium, for from twenty-four to thirty-six hours, after which a concentrated solution of sulphur is added. After another soak in an acetate of lead solution, at 95 deg. to 120 deg. Fahr., it is thoroughly dried and polished with lead, tin, or zinc, as may be desired, when it resembles shining metal.

CAT'S-EYES.—The cat's-eye is so called because when cut it displays a peculiar floating lustre, resembling the contracted pupil of a cat's eye when held to the light. This appearance is supposed to be caused by the presence of small parallel fibres of asbestos. The finest specimens of the stones come from Ceylon and Malabar. The largest known is in the Beresford Hope collection, South Kensington Museum. It formerly belonged to the King of Candy. It is hemispherical, 1½ inches in diameter. Cat's-eyes are very highly esteemed by modern Moors and Hindoos, and are frequently worn as an amulet. They are supposed to act as a charm against witchcraft, and to possess the virtue of enriching the wearer. The chemical composition of cat's-eye is 80.2 alumina, 19.8 glucina, with slight traces of protoxide of iron, oxides of lead and copper, according to the locality where it is found.

AFRICAN DIAMONDS.—It is estimated that over eight tons of diamonds have been unearthed in the South African fields during the last eighteen years; this represents a total value of $275,000,000.

LEAD DUST.—Cases of lead poisoning among the Jacquard weavers in a Swiss factory were traced to the dust from leaden weights which are used by the weavers to carry the thread of their warp. After the varnish has been rubbed off from the weights the lead begins to wear away, and falls in fine particles among the dust on the floor. In some cases the dust was as much as 56.86 per cent. lead, and even when the utmost care had been taken 9 or 10 per cent. of lead was found in it.

LEMON SOAP.—Lemons are used for soap in many countries where they grow. When, for instance, the men and women of the West Indies want to wash their hands, they squeeze the juice of a lemon briskly in water until they are clean. There is an acid in the lemon similar to that used in soap. And in countries where oranges grow in great plenty country gentlemen use the cheapest kind for blacking their boots. The orange is cut in two and the juicy side of one-half is rubbed on the soot of an iron pot and then on the boot. Then the boot is rubbed with a soft brush and a bright polish at once appears.

SHAMOY LEATHER.—Shamoy or wash leather, properly chamois leather, is so called because originally and when of the best quality it was made from the chamois or wild goat inhabiting the Alps and Pyrenees. It is now made chiefly from the skin of deer, goats and sheep. It is essentially distinguished from other kinds of leather in being dressed with oil without salt, alum or tan, and in the grain being taken off. The skins are brought to a state of pelt by liming and washing. The buff color is imparted by dipping into gamboge, not to tan, but to dye them.

AMERICAN ANALYST

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Relating to Man's Physical Need and Comfort.

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CONTENTS.

OXALIC ACID BAKING POWDER.

We question whether a more flagrant outrage upon public confidence was ever perpetrated than the attempt to introduce, under the pretext of its being a phosphate baking powder, the poisonous oxalic acid compound exposed by the AMERICAN ANALYST last week. Certainly, in six years' experience in examining and bringing to light the schemes of food sophisticators, nothing so monstrous has come under our observation. Ordinary adulterations, designed to lessen the cost of production, by the addition of cheap and harmless ingredients, or even the grosser frauds that substitute a worthless semblance of a commodity in the stead of the article demanded by the purchaser, pale into paltry insignificance by the side of this atrocious attack upon the integrity of the most important staple of human diet. Every household in the community, every family in which the prayer for "daily bread" is uttered, must feel itself outraged. The subject, however, has passed out of our hands into those of the Health authorities of this city, and we have good grounds for the statement that ample atonement will be exacted from the persons upon whom the guilty responsibility shall be proven to rest. As a matter of course, the subject attracted wide attention as soon as the issue of this paper containing the exposure was published. The only attempt at an explanation that has been brought to our knowledge is the flimsy statement of the inventor, embodied in the relation of the case published by the New York *Staats Zeitung*. For the information of our readers, we translate from the issue of that journal of July 25th, as follows: "It is a well-known fact that adulteration of food products nowadays is carried on with astonishing cold-bloodedness and perseverance. When such adulterations are sold, as they can be readily, on the market at very low prices, and are introduced on the strength of certificates given by reputable chemists, their power for mischief is vastly increased. On the other hand, it must be reassuring to the public that such adulterations cannot be long offered for sale before they will be submitted to chemical analysis and scientific investigation. This has again been proven by the following facts, which were the results of an investigation of 'Dr. Arvine's French Tartar,' made and published by the AMERICAN ANALYST." The history of the case, as published in our issue of July 24th, is then stated at length, and the article concludes with the report of an interview with Mr. T. W. Arvine. This occurred at Arvine's laboratory, where the reporter found him, surrounded with retorts, bottles and chemicals of all sorts; in fact, as he states it, 'all the apparatus of a witches' kitchen.'" After reading the article in the AMERICAN ANALYST carefully, Mr. Arvine said he was not then ready to answer it, as his preparation had not yet got out of the experimental stage and was not yet patented, so he could not publish his secret, which would be necessary in order to answer the article. He would, therefore, have to content himself by saying that the article in the AMERICAN ANALYST contained several misstatements which he would contradict as soon as his product was put on the market, which had not yet been the case. He claimed that his preparation was not injurious to health, that the powder analyzed by the chemists was not the same as his baking powder would be when finished, but was only the powder now made by him experimentally with oxalic acid and other things. We will add, in conclusion, that the statement made by the *Evening Sun*, republished in another place in this issue, that the officials of the Board of Health were unable to find any of the adulterated powder in possession of Mr. Jenkins or Mr. Arvine was not true, as those officials have ample evidence in their hands to legally prove every statement published in the AMERICAN ANALYST, and when the proper time comes, Mr. Jenkins will find that his lame excuse that he had none of the "French Tartar" on hand, but expected a shipload from France, will not shield him. It does not take ships to bring oxalic acid from 32 Washington Street to 124 Warren Street.

AN UNGENEROUS ACT.

The *Evening Sun* of July 24 published an account of the AMERICAN ANALYST's exposure of the Arvine French Tartar business, which we reproduce in another column. In a later issue of the *Evening Sun*, on that same date, the article was altered by omitting the name of the AMERICAN ANALYST in the two places where it occurred in the original print and the substitution therefor of the words "a trade paper." The injustice of the alteration is as apparent as its untruthfulness. Desiring to at least set ourselves right on the record, we addressed to the editor of the *Evening Sun* the communication published below, to which, however, no attention was paid:

OFFICE AMERICAN ANALYST,
19 Park Place, N. Y., July 25, 1890.

Editor Evening Sun:

In your "Wall Street edition" of yesterday you assert that the exposure of the poisonous Arvine Baking Powder was brought about by a trade paper. The person who wrote that paragraph jumped at a remarkable conclusion. The AMERICAN ANALYST, which detected and denounced to the Board of Health the dangerous fraud, is not in any wise a trade paper, but a popular science journal, whose special mission is the exposure of food sophistications. As your earlier editions gave the credit fairly and generously to the AMERICAN ANALYST, where it belongs, the altered designation used in your later issue is difficult to understand. It would not be worth referring to were it not that the readers of the *Evening Sun* are likely to be misled into underestimating the motives that actuated the exposure.

Yours respectfully,
THE AMERICAN ANALYST.

LUNACY AND DEATH.

Dr. Giacchi, of Turin, in writing on the manner in which lunatics die, observes that often lunatics present in the later periods of their unhappy existence a surprising metaphorphosis. A notable number of acute or chronic lunatics, and even demented subjects, who for some reasons have been incapable of reasoning correctly, miraculously recover on their death-beds full consciousness of themselves. They die conscious, and often placidly and serenely, as much and even more so than persons of sound mind who succumb to the same malady. Often, in the few days which precede death, one finds in the one as well as in the other (sane and insane persons) a complete interversion, particularly when life is extinguished by the aggravation of chronic maladies of the abdomen or of the chest. Thus, while the phthisical subject or patient affected with chronic diarrhœa at its last stage is often in a state of mental aberration, or at least of weakness of the intelligence; on the contrary, the lunatic, under the influence of the last stages of physical disease, sees the darkness of his intelligence dissipated; similar to the flame which is about being extinguished, the mind resumes its lucidity, a striking contrast with the darkness or agitation of insanity.

FRENCH TARTAR.

WHAT THE N. Y. PRESS SAID CONCERNING THE "AMERICAN ANALYST" EXPOSURE.

Evening Sun.

OXALIC ACID FOR YEAST.—Some time ago "Dr. Arvine's French Tartar" was advertised by printed circulars as being superior to all existing baking powders, in price as well as quality. There are many excellent baking powders at present in the market. Their owners battle fiercely with each other about prices. In fact, there is always going on "a baking powder war." When it was found that the price of the new baking powder was below the cost of manufacture in other cases, the suspicions of the editor of THE AMERICAN ANALYST were aroused. This gentleman submitted specimens of "Dr. Arvine's French Tartar" to Messrs. Wyatt & Weingaertner, who, after analysis, pronounced the "French Tartar" to be principally oxalic acid. Oxalic acid is a dangerous poison. Then a call was made on Maross Jenkins, 124 Warren Street, whose name was signed to the circular. He said that he was only agent for F. W. Arvine of 32 Washington Street, formerly employed by the Standard Oil Company. Mr. Jenkins had submitted the powder to Messrs. Stillwell & Gladding, chemists to the Produce Exchange, who had recommended it highly. He had also received a letter from Dr. Arvine, in which he said that the powder was all right—not to be frightened, but to go ahead and to furnish "steer samples" to any one that might inquire. Then Mr. Gladding was seen. He refused to test for oxalic acid and warned the representative of the AMERICAN ANALYST to be careful. On this samples of "Dr. Arvine's French Tartar" were submitted to Dr. Gideon Moore of 221 Pearl Street and to Dr. Theodore Breyer of 110 Front Street. Both these eminent chemists agreed that the samples of "Dr. Arvine's French Tartar" consisted of starch, oxalic acid, with small quantities of soda; lime, and phosphoric acid. The only active acid present was declared to be poisonous oxalic. A fatal dose of oxalic acid is sixty grains, but dangerous symptoms appear far below that amount. It was found by qualitative analysis that "Dr. Arvine's French Tartar" contained 40 per cent. of poisonous oxalic acid. Reckoning two teaspoonfuls of baking powder to the quart of flour there would be seventy grains of oxalic acid in the bread. When these facts were submitted to the Health Board, President Wilson at once directed an inquiry for the powder to be made, in order that it might be analyzed. Mr. Wilson said this morning that a member of the Chemist's Department of the Board had called at 124 Warren Street and asked Mr. Jenkins for a sample of the powder. Mr. Jenkins replied that he was very sorry, but he had none. There was a cargo of "Dr. Arvine's French Tartar" at sea, but it was unaccountably overdue for three days. Repeated attempts had no better effect. A trial will be made at one or two large baking companies uptown that professed to use the French tartar, but the Health Board are not sanguine of success.

Daily News.

OXALIC ACID BAKING POWDER.—The editors of the AMERICAN ANALYST have been making an investigation into a baking powder which they have found to consist principally of oxalic acid. The powder has been indorsed by the owners of large bakeries in Newark, Yonkers and this city. It is called "Dr. Arvine's French Tartar," and is advertised as being cheaper and superior to other baking powders now in use. The powder was offered for sale at a price much below what phosphate baking powder can be made for, and the editors of the ANALYST had it analyzed. It is manufactured by F. W. Arvine, 32 Washington Street, and a big bakery in this city has been using it. It has a certificate of Stillwell & Gladding, chemists of the New York Produce Exchange, who say, that "after a careful analysis of Dr. Arvine's French Tartar we recommend it from a hygienic standpoint as being a pure and wholesome article, free from alum and other adulterations." The powder, on behalf of the ANALYST editors, was analyzed by Messrs. Wyatt & Weingaertner, and afterwards by Dr. Gideon E. Moore and Dr. T. Bryer. Dr. Moore reported that the sample he analyzed consisted essentially of a mixture of oxalic acid and corn starch. As bread made from this mixture would require about two teaspooufuls to a quart of flour it is estimated that 20 grains of oxalic acid were contained in every loaf made from the tartar. The following letter has been received by the Board of Health from the ANALIST: "Your attention is called to a so-called baking powder sold under the name of 'Dr. Arwine's French Tartar' by Maross Jenkins, 124 Warren Street, and manufactured by F. W. Arvine, 92 Washington Street. This contains about 40 per cent. of oxalic acid. It is made in different strengths, and different samples have been furnished by said Jenkins. The powder has been used by the —— —— Baking Company here, and several others outside of this city.

THE AMERICAN ANALYST."

The N. Y. World.

IS THE POWDER POISON?—President Wilson, of the Health Board, yesterday had his attention called to an alleged spurious or highly adulterated baking powder, known as Dr. Arvine's French Tartar. This powder, it was said, had been subjected to a careful analysis by Messrs. Wyatt & Weingaertner, and also by the Produce Exchange chemists, Stillwell & Gladding. Wyatt & Weingaertner, it is understood, pronounced the tartar to be mainly oxalic acid, which is known to be a rank and dangerous poison. President Wilson declined to talk on the subject until the Board had made a thorough inquiry into the matter. A cargo of the stuff, however, is expected to arrive here within a few days by the agent, M. Jenkins, of No. 124 Warren Street. It is said that Agent Jenkins submitted samples of the tartar to Messrs. Stillwell & Gladding, who had recommended it highly. Agent Jenkins is also reported to have received a letter from Dr. F. W. Arvine, who was formerly connected with the Standard Oil Company, telling Jenkins that the powder was all right; not to be frightened, but to go ahead and furnish "steer samples" to any one that might inquire for the stuff. Dr. Gideon Moore, of No. 221 Pearl Street, and Dr. Theodore Breyer, of No. 110 Front Street, who also tested the tartar, agreed that the samples in their possession consisted of starch, oxalic acid, with small quantities of soda, lime and phosphoric acid. A fatal dose of oxalic acid is sixty grains, while much smaller quantities than that would produce dangerous symptoms. In the tartar analyzed there was 40 per cent. of poisonous oxalic acid. Reckoning two teaspoonfulls of baking powder to a quart of flour, there would be about 70 grains of oxalic acid in the bread.

THE OHIO ADULTERATION LAW.

A CIRCULAR FROM THE STATE COMMISSIONER.

In our issue of July 3, on page 316, we published the new Adulteration Law, passed April 22, by the Ohio Legislature, to go into effect on the 1st of September. In anticipation of its operation, and in order to explain its scope and intent, the State Dairy and Food Commissioner, the Hon. Edward Bethel, has issued a circular, which we reproduce herewith:

OFFICE OF THE OHIO DAIRY AND FOOD COMMISSIONER,
COLUMBUS, OHIO, *June*, 1890.

To the People of the State of Ohio:

In conjunction with the air we breathe, the quality of the food we use for the growth and nourishment of our bodies, thus furnishing the essential elements of our subsistence through life, is of the first and highest importance to each individual of a community. It follows, therefore, that it becomes the natural duty of every individual to see and know that his daily food is good, wholesome and pure, and that it becomes the public duty of every community to guard its members against the use of such adulterated or impure articles of food as are found offered for sale within the limits of its jurisdiction. The Legislature of Ohio, during the last four years, has taken advance steps in the direction of defending the people of this State against the manufacture, sale and use of spurious or adulterated articles of food, drink and drugs. In addition to the passage of general laws for this special and beneficial purpose, the Legislature has created the office of Dairy and Food Commissioner, whose legally prescribed duties are the enforcement of the requirements of the laws in relation to this matter of every-day importance to each and all of the inhabitance of our State. The Ohio law creating the office of Dairy and Food Commissioner was passed May 8, 1886, and amended March 21, 1887. The law as amended provides for two Assistant Commissioners and for three chemists, with powers of entry, examination and analysis, whenever they have reason to believe that articles of food or drink are made, prepared, sold or offered for sale, and with authority to inspect the books of any such place, to open any cask, tub, jar, bottle or package containing or supposed to contain any article of food or drink, and obtain an analysis of the contents thereof. The Prosecuting Attorney of any county in the State, when called upon by the Commissioner or our Assistant Commissioner, is required by the said law to render all legal assistance in his power to enforce the same, and to assist in the prosecution of cases arising under the provisions of said statute. All fines assessed and collected under such prosecutions must be paid into the State treasury. The Legislative acts providing against adulteration and deception in the sale of artificial dairy products, against the adulteration of food and drugs, against fraud in canning fruit and vegetables, against the adulterations of liquors, vinegar, candy, etc., and the acts regulating the sale of impure milk, butter or cheese, as distinguished from the pure, or in imitation of the natural products, and also the act passed April 22, 1890, "To amend Section 3 of the act to provide against the adulteration of food and drugs passed March 20, 1884," may be found in the Revised Statutes and annual law books published by the State, and most of them in the appendix to the Fourth Annual Report issued from this office. The last of said acts takes effect September, 1890. The law provides for the printing of two thousand copies, in pamphlet form, for general distribution, of each annual report of the Dairy and Food Commissioner to the Governor, the fourth of said reports, for the fiscal year 1889, containing also most of the laws above specified, is now printed, and copies will be furnished on application to this office, or to either of the Assistant Commissioners at Cincinnati or Cleveland. Having the honor of being the third Dairy and Food Commissioner appointed by the Governor of Ohio to fill

said office, my term dating from the 13th ultimo, I deem it proper to follow the example of my worthy predecessors, General S. H. Hurst and Hon. F. A. Derthick, by issuing occasional circulars to that portion of the public engaged in the traffic in provisions, and to all other persons whom it may concern, in relation to the direct powers and duties conferred by the laws of the State on this officer, and also to the practical scope of his official functions. Upon entering this office, the question at once presented itself: In what manner shall I discharge the duties required of me so as to effect the most good with the limited means at my disposal? Notwithstanding the zealous efforts of my immediate predecessor to enforce the law, I find a large proportion of the food producers, manufacturers, dealers and consumers continually inquiring as to what the pure food law is, as to how it should be enforced, and as to the proper mode of rendering assistance in the detection and punishment for violations of its requirements. To give a general answer to numerous inquiries of this kind is the main purpose of this circular. There seems to be a common impression that it is the official duty of the Dairy and Food Commissioner and his Assistants to travel from place to place and spy out or hunt up violations of the food laws. But the fact is, with the limited means in the appropriations at our command, it would be simply impossible to keep watch over all the manufacturers and dealers engaged in the food traffic within the large and populous State of Ohio. I assume, therefore, that it is not the intent of the law to require the Dairy and Food Commissioner and his Assistants to take upon themselves any such extensive supervision in person. Any information, however, of violations of the food laws, communicated by letter or otherwise, to the Commissioner, or either of his Assistants, will be thankfully received and treated as strictly confidential, when signed by the genuine names of reputable citizens; and such information shall be promptly acted upon by officially following up the clews therein furnished with special examinations. Persons knowing of such cases of violations, or having sufficient reason to believe that any such have occurred, should at once report the same to the Commissioner or one of the Assistant Commissioners, giving the names of the persons, localities and all other particulars involved, so far as known, together, if possible, with a sample or sample of the spurious, adulterated or unhealthy article or articles. Such degree of information should thus be given to the Commissioner or to one of the Assistants as should go before a grand jury for an indictment in a State case. Upon the receipt of the desired information the Commissioner or an Assistant Commissioner will visit the place or locality designated, and enter upon the official inspection, examination and analysis authorized by law. The Commissioner and Assistant Commissioners will make such other visits and examinations at their own instance as they may deem proper; and they will make as many visits altogether during each fiscal year as the appropriations placed at their disposal will meet the point of expenses. The earnest co-operation of all persons and firms engaged in the legitimate industries affected by fraudulent adulterations or injurious imitations of their food products is hereby cordially invited. They are urgently requested to report, forthwith, the facts of any violations of the food laws to the Commissioner or Assistant Commissioner in the District wherein the same are known or are supposed to have occurred, in order that the matter shall be promptly investigated and the abuse stopped. Although the principal object of this office will be to promote and encourage the strict observance of the laws to regulate the sale of certain articles of food, drink and drugs, as above indicated, rather than to institute prosecutions under said laws in the courts, yet I wish to be distinctly understood that the legal obligations of the office shall be discharged without fear or favor and that willful or persistent violators of the food laws shall be prosecuted and punished to their full extent, within the means and powers at our command to reach such infringements and the offenders. The law makes violations of the requirements as to food, drink and drugs *misdemeanors* and imposes penalties upon conviction of from $25 to $1,000 on persons, firms and corporations, with the punishment on persons of imprisonment from ten days to one year, in addition to the costs and other expenses of prosecution. Under the act to prevent adulteration and deception in the sale of dairy products, one-half of all fines collected shall be paid to the person or persons furnishing the information that has procured conviction. All fines collected under prosecutions begun by the Commissioner or one of his Assistants shall be paid, one-half into the State treasury and one-half into the County treasury where the prosecution took place. The law also makes it a special duty of Prosecuting Attorneys to institute actions in the name of the State for the recovery of penalties under the act to prohibit the manufacture or sale of adulterated wines within the State of Ohio. Prosecuting Attorneys are also required, when called upon by the Commissioner or any Assistant, to render him any legal assistance in his power to execute the laws, and to assist in the prosecution of all cases arising under the provisions of the food laws. Any Justice of the Peace, within his county, Police Judge or Mayor of any city or village within the same, is given jurisdiction in cases of violation of the laws to prevent adulteration of and deception in the sale of dairy products and drugs or medicines. The costs in all such cases wherein the prosecution fails or wherein the defendant, if convicted, is committed in default of paying fine and costs, shall be certified under oath to the County Auditor, who shall issue his warrants on the County Treasurer in favor of the persons entitled to such costs. Hoping that the food laws will be accorded the full, voluntary obedience and respect which they merit from the whole people of our State, I trust my official relations with all concerned may be pleasant and agreeable.

EDWARD BETHEL,
Ohio Dairy and Food Commissioner.

LOOKING FORWARD.

A PROPHET'S PREDICTIONS OF NEW YORK'S EARLY DESTRUCTION.

This country is doomed to have a time of untold horrors in the by no means distant future if the deductions of Professor Joseph Rodes Buchanan, M. D., from the sciences he has "esoterically cultivated" are correct. The *Arena* contains an article of some twenty pages by the Professor on "The coming Cataclysm of America and Europe," in which he predicts terrible things that are to happen to this continent, while coming European catastrophes are dismissed in a few sentences. Universal ruin is to fall upon this country, according to the Professor. He starts out be endeavoring to show that just now everything financial and political is in a bad state, and that a "crash utterly unexampled is coming." He asserts that a "Jeffersonian republic" cannot stand on a "prince and pauper basis or a mighty landlordry and an humble rackrented tenantry," and that Mrs. Partington's problem as to the effect when an irresistible force meets an immovable obstruction is the problem our nation will soon be engaged in solving." Capital would appear to be the "immovable obstruction" and labor the "irresistible force," and "the spirit of nationalism, universal fraternity, is, of course, the remedy" for the present evil condition of things. In his own prophetic power he scarcely has the shadow of a doubt, and so he boldly declares that "the Republican party will be hurled from power. A Democratic administration will come in, and that, too, will fail to give satisfaction. It will be succeeded by what may be called the labor party." This, however, will not serve the purpose of destroying the element of discontent, and "nineteen years hence war, or quasi war, will appear in this country, and the convulsion will not be arrested until about 1916." The six years prior to that date," continues the seer, "will be by far the most calamitous that America has ever known." The Professor says he could "give a lurid description of the horrible scene that rises" before him, but in his mercy he abstains. The war will be beween labor and capital, intermingled with a religious element, and at that time "the Church as a power will be thoroughly shattered," and the "old Bible" will be relegated to the shelf. "The twentieth century," he says, "will witness the expiring struggle of Biblical Christianity," and the twenty-first "the existence of a religion in which all that was good in the past will survive." The Professor jumps from social to geological and astronomical terrors. Here he seems to be peculiarly in his element, and oceans of water and flame roll and leap before his prophetic vision, and he shrieks in anguish for threatened calamities. Large regions of America will become barren, and the Mississippi will become a scourge as terrible as the Yang-tse-Kiang has become to China. "Terrible cyclones" and "strange seasons" are among the calamities "when the warmth of summer shall fail and the bounties of agriculture be denied us." Fourteen years hence, he declares, cold seasons will crush agriculture, and the sea of fire beneath our feet will be getting ready for action. He proclaims solemnly that it is not unlikely, according to his laws of "periodicity,' that some such astronomic event as that which "whirled the earth from its position, charged its poles and overwhelmed its tropical climates in ice over 100,000 years ago may occur in our time of calamity from 1910 to 1916." But apart from this, the professor insists on dealing out specialties, such as the destruction of the Atlantic seaboard from New England to New Jersey, convulsions on the Pacific coast, rumblings right, left, and centre, with tidal waves *ad lib.* thrown in. "Our Atlantic seaboard is doomed," he proclaims in large capitals. He announces further on that it is his "firm conviction that in the midst of our coming civil war the Atlantic coast will be wrecked by submergence and tidal waves from the borders of New England to the southern borders of the Gulf of Mexico. There will be no safety below the hills." Manhattan Island, New Jersey and every city near the coast, from Galveston to New York, with New York to afford the "grandest horror," will be destroyed. This destruction will occur "twenty-four years ahead; it may be twenty-three, and it will be sudden and brief—all within one hour, and not far from noon." All around, North, South, East and West, there will be nothing but destructive waves and earthquakes and floods, and after all nationalism will be triumphant. Europe will suffer principally through the utter destruction of monarchy, and one of the calamities will be death of Queen Victoria next year in a strange apoplectic fit, and ten years later the Prince of Wales, having previously abdicated, will end his life. Other notabilities also come in for attention. The professor advises people to clear away from the Atlantic coast in less than fifteen years if they wish to be safe, and in conclusion says that "the great cities will go down with all their splendor and wealth, poverty and crime, and fierce men in the interior will rejoice in the calamity and death of millionaires. But the continent with its new seacoast will be safer from convulsions, and seventy-five or eighty millions can spare one million without arresting their march to power and dominion."

ELECTRIC CABS.—A system of electric cabs has been introduced in Stuttgart, with a degree of success that promises the permanent relegation of the cab horse to other fields of usefulness. The new vehicles are already popular, though at present their novelty has much to do with the patronage they receive.

VARIED TREATMENT.—Bobby (looking out of the window): "What's the matter with the horse, mamma?" Mother: "The horse is balky, Bobby; he won't obey his driver." Bobby: "Well, what's the man patting him for?" Mother: "He's coaxing him." Bobby (with an injured air): "That ain't the way you treat me when I'm balky."—*London Tidbits.*

NEW BOOKS.

MICROBES AND THE MICROBE KILLER. By William Radam. 1890. Published by the Author in New York.

It would be barely possible for any person, unacquainted with the history and literature of these infinitesimally small organisms which teem in such countless myriads around us, not to be attracted by the contents of this volume. Whoever its compiler may have been, he has succeeded in grouping together, in a very flowing and colloquial style, a series of well-known scientific discoveries, and it is a pity that they should be made the vehicle for advertising the personality of Mr. Radam and of his nostrum. But for this, the book might have rendered some service to a large class of readers. As it is, while we have met with few works of its kind which exhibit more of what might be useful and commendable, it has been thoroughly prostituted to serve the purposes of a quack, and must consequently be denounced as a humbug.

There is an enterprising shoemaker in this city who extensively advertises his wares in the columns of the daily press, and takes advantage of the opportunity thus afforded him to obtrude his own portrait upon the readers of the papers.

Following this brilliant example, Mr. Radam, in several different styles, presents himself on several pages of his book, and is specially desirous of becoming known to fame, *not* as a physician, a druggist or a scientist, but as a mere "student of nature!" The greater portion of his life—so he informs us—has been passed in the country. He has been engaged in the elevating and ennobling pursuits of truck-farming, the planting of vegetables, fruits and flowers, and he has spent his leisure time as a close observer of natural phenomena. Pursuing his studies upon a plan entirely his own, he did not stop to formulate theories, or condescend to look for something previously outlined in his mind. He simply went forth into the fields and found out all about microbes, and then went back into the house and invented the "microbe killer." This remarkable discovery was, of course, the turning point in his career. He tested the value of the "killer" and found nothing wanting. "It withstood the severest trials and maintained itself under all circumstances. It promised to reform existing methods in the treatment of disease, to expose the errors that have been for centuries in vogue, to simplify human knowledge in fields of vital moment to the health and welfare of his fellow man. Sweeping in its influence, it was simple in its nature, and calculated to wipe out all the complexities of hygienic and curative principles by its oneness and intensity."

Can we read all this and still doubt that Radam has been, indeed, a student of nature—of human nature—and that he has made the best and most profitable use of his time? His is no ordinary or vulgar appeal to public credulity. He stands forth upon a pedestal, and, looking down upon poor, ignorant, suffering humanity, cries out: "The greatest of scientists, living and dead, have admitted that every species of disorder or disease incidental to human life is directly attributable to the influence of bacteria, Bacilli or Fungi. Do you doubt me? If you do, consult the writings, listen to the speeches of these great men, and see whether I deceive you. This is the most recent advance in the discoveries of modern science, and modern science has stopped there. But, oh, my friends, *I*, Radam, have not stopped. *I* have taken up the thread where science laid it down; *I*, in my study of nature, of nature's laws and nature's handiwork. It was reserved for *me* to find out and declare that since all diseases are traceable to the same cause, all should alike yield to one mode of treatment. Yet is this not a logical conclusion? Come up! come up! try my "microbe killer! it is only $3 per jug, and will cure all the ills that flesh is heir to!"

All this is preposterous; yet it has withal a pleasing sound of probability, and drowning men catch so readily at straws. A few glib utterances on the little known subject of microbes; a few facts borrowed from conscientious investigators; then, toot! toot! goes the horn; bang! bang! goes the drum. "Come up and buy," says the voice, "it is your only chance of health and happiness." Would it not be grotesque if it did not threaten to become so dangerous?

If we come to look into the facts of this bacteria matter, how does it really stand with us? Have we any very definite knowledge to guide us, or have we none? Alas! all, or nearly all, we know is uncertain and obscure. No branch of natural science has received more attention during the past thirty years. We have benefitted by the researches of Pasteur, Koch, Cohn, Toussaint, Cagniard-Latour, Schwann, Rees, Hansen, De Bary, Chaveau, Bienstock, Kurth, Miller, Duclaux, and a host of others; but yet, even in the light of all their discoveries, it is still almost impossible to decide how the injurious effects of supposed virulent bacilli are brought about. As the investigators themselves have been the first to declare, we must still look for enlightenment to future and more precise researches and experiments. It is deemed undeniable that a large number of known diseases are caused by microscopic parasites. It is no less certain that there are a very considerable number of maladies in which, despite the most industrious and minute search, no trace of accompanying parasitic growth has yet been found.

While what is known to us, therefore, as the *contagium vivum* doctrine of Henle has been very widely disseminated and accepted, it is still held, and, in our opinion, very rightly held, that in the present state of our knowledge it would be wrong to attribute every conceivable form of disease to bacteria or fungi. It would be contrary to principle and to common sense. From what we have ascertained of the wide diffusion of bacteria possessing full power of development, it must indeed be readily granted that they may be developed in a diseased body either before or after death. Some particular germs may be present as a characteristic feature of, and even constantly and exclusively in, a particular disease, and yet not be by any possible means the contagium by which the disease is caused.

To quacks and charlatans, with no other object than the wholesale disposal of their remedies, assertiveness is a stock in trade. Truth, or even logic, is of secondary importance. The real lover of science, however, who works for the benefit and advancement of his fellows, is actuated by totally different feelings. In his case it is necessary to proceed step by step by actual experiment and to obtain a clear and definite result. The parasite he examines must be obtained in a state of purity and free from all admixtures. There must be a pure infection, with the pure parasite, of a proper subject for experiment, and there must also be the strictest control and criticism of the result. Only by such methodical and successful experimentation as this, can anything by proved. Without it, there will always be a gap to be filled up by arguments, and these, however well adapted they may be to serve as the foundation of a personal conviction, cannot be accepted as positive evidence.

If we were allowed to experiment freely upon human beings, our progress might be less slow; but we are not, and we know with certainty that parasites do not thrive equally well in every host-species. They can attack and cause disease in one, and not in another. This being the case, how can our most intelligent and advanced practitioners do otherwise than still remain in doubt, while submitting all discoveries to the strictest and most impartial investigation?

That the respiratory and alimentary canals of healthy as well as of unhealthy human beings are constantly accessible places for the entrance of germs with food and air, no one will attempt to deny. These passages may in truth be called well stocked gardens of vegetating bacteria. But, when we have admitted that, what of it? No clear determination of the nature of all these germs has yet been even attempted, and so far as our knowledge goes, we may take it for granted that those which are not useful as protectors against an invasion of destructive ferment forms, are almost without exception harmless guests, which are destroyed or paralyzed in their passage through the body by the alternating acid and alkaline secretions.

We must remember that the whole process of alimentation is carried on through the agency of a variety of organized ferments. Without their action no portion of our food could be decomposed, digested, or made ready for assimilation by the blood. How can this well established rule accord with the idea of an universal "microbe killer," which, in order to be effective, must, of a necessity, be indiscriminate in its action? To believe that such a remedy, upon introduction into the system, would seek out and ruthlessly destroy all germs of an injurious or noxious nature, while leaving in undisturbed repose such of them as are necessary for the proper working of our internal organization would surely require more credulity than that possessed by the most gullible of Radam's followers. Apart from this absurdity, however, there really exists in all unprejudiced minds a sincere doubt as to the possibility of dealing out destruction internally to any of these minute forms of life. In the first place, no remedy, liquid or solid, could be regarded as effectual which did not destroy or paralyze the protoplasmic contents of the germ-cell. There are, of course, plenty of poisons sufficiently corrosive and violent to achieve this end; but, could we for a moment seriously contemplate their administration even in a state of the most extreme dilution? Supposing we did agree to such a contemplation, could we close our eyes to the fact that no poisonous bodies yet known to us, whether derived from organic or inorganic sources, act in the same way upon all germs, fungi or bacteria?

Absolute alcohol, for example, is a poison immediately fatal to protoplasm; yet it has been shown by Pasteur that the spores of *bacillus anthracis* may lie for several weeks in absolute alcohol and still retain their vitality. The gelatinous membrane enveloping the protoplasm of some of the species of bacteria is insoluble in, and impenetrable by, alcohol. Hence, we have at once an instance where one of our most powerfully corrosive poisons would, if introduced into the alimentary canal, immediately destroy that category of germs essential to our well-being, while leaving unharmed the parasites from which we desire to be free. In practical life, while it behooves us to constantly seek for an increase in our knowledge and thus to enlarge our sphere of general usefulness, we must still content ourselves with a very cautious advance and an experimental application of newly recognized laws. If there were anything like a complete and accepted classification of all the species of bacteria, a classification that would enable us to at once distinguish between those species which are necessary or innocuous, and those which import and disseminate disease, there might possibly be some justification for seeking after a poison, which while leaving the one class intact, would annihilate all the others. But, alas! no such general classification has yet been possible, nor have we much ground for hope that it soon will be. Assuming, however, that such a perfect recognition were eventually made, we can see the importance that would attach to any inquiry into the specific sensibilities of each species and can understand that the results of this inquiry might probably be the introduction into the practice of medicine and hygiene of many remedies, now unknown, for the removal or prevention of human suffering.

There are, of course, always a multitude of people in the world who ignore or despise the benefits of science, and who prefer, in their besottedness, to believe in the incredible, supernatural, or phenomenal, rather than in anything which has been criticized and accepted by sound judgment and common sense. In view of this fact, the work before us will no doubt prove a very

remunerative speculation for Mr. Radam from its standpoint as an advertisement of his "microbe killer."

Of what that nostrum is composed, or how it is compounded; whether it is made from the winds or from the waters, from elements above the earth or underneath the earth, we neither know nor care. If it contains aught that is absolutely dangerous, it will, in due time, commend itself to the Board of Health authorities, and be quickly suppressed, whereas if it is a harmless mixture, it will no doubt work out its own destiny. In any case its inventor's pocket book will grow in rotundity and his factories increase in numbers, until in the eternal fitness of things his gulls are educated out of their folly. When that time comes, he will be too rich to return to his old trade of potato digging, but he may retire to some peaceful spot and end his days in the contemplation of bugs in his own nursery garden.

ELECTRICITY'S FUTURE.

NO ASSIGNABLE LIMIT TO ELECTIRICAL PROGRESS.

As we sweep, in the swiftly flying car of industrial progress, past so many marvelous achievements in the field of electricity, and realize how prolific has been its contributions to the comfort of society, we are forced to ask the question, "Has not the ground in this art been fully worked and its fertility been taxed to its utmost limit?" But if we examine carefully the passing scene we need not ponder long to feel convinced that the end is not yet. The great mill where genius carries its grist to be sifted and ground—the Patent Office—lays its books open to the public once every week; new customers are constantly arriving and the old ones appear regularly on its pages. Occasional discoveries of latent principles, never dreamed of by the old philosophers, show that even in its scientific aspect this art is in its infancy, and every find of this kind opens up a new realm of exploration by being harnessed to bits of metal and made to perform useful work. It requires no prophet to foresee that "still there's more to follow." Electricity is a splendid vineyard to labor in and offers up plenty of room for thinking workmen. The strong tendency of the human mind to follow a beaten path has brought about a high degree of perfection in methods of application already mapped out. The dynamo, the motor, the telegraph, and other generically old forms of apparatus, have been improved to a high degree of refinement, but there are many chances for an investigator in by-paths over ground as yet unbroken. The frolicsome and malign primary battery may some day bob up serenely with a lambent smile that will put to shame the proud pretentions of storage cells. An efficient gas battery would have a wide range of commercial application, with nothing to be consumed but gases, a material light in weight and capable of compact storage. The problem of rapid transit might be neatly solved and it is quite possible that the dynamo-electric machine will find a competitor for local uses. In the laboratory of nature one combination exists in the generation of atmospheric electricity and cloud-charging, but no man has yet learned the secret as to copy the action. May it not be possible that the physical disintegration of water into vapor creates an intermolecular disturbance which rouses the mysterious agent? It would seem as if the twin sisters, heat and electricity, do not yoke well together. One always sneaks out of the back door when the other enters the front. One makes the place too warm to hold the other. In the action of thermal batteries, electricity is put to route by the entering heat, and even in primary batteries the same little personal idiocyncrasy is dominant, for heat is developed by combustion of the active electrode; on the other hand, when a sportive current of electricity glides like a fleet-footed Mercury into a conductor, heat immediately vacates the premises. These phenomena are signboards on a promising by-path, and one, as yet, very slightly explored; thermal batteries are full of promise. The day is not far distant when the glory of the telephone will be eclipsed by visual telegraphy. A few foot-prints have already been made in this path. The end is not inaccessible, and when it shall have been reached, many of us will be surprised that we did not see it ourselves. Freight transmission is another path full of promise; perhaps by the time of the World's Fair, Chicago can ask New York for the loan of a V and be accommodated the same afternoon. With a straight overhead rail and enough current, 200 miles an hour is within the range of possibility.

The scope of electrical accomplishment widens every day. What seems like the present horizon is only an apparent limit; as we move on, the margin will keep constantly shifting like the junction of earth and sky and both in science and industrial art the comming generation will find the vista of the future as bright with promise as that of the past is rich in gifts.—*Electrical Review.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

August.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal, venison.

FRUITS.—Cherries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple, grapes, plums.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, crabs, clams, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, salmon, turtle, trout, sturgeon, whiting, weak-fish, rockfish.

VEGETABLES.—Beans, beets, cucumbers, cabbage, carrots, cauliflower, corn, egg-plant, lettuce, onions, parsley, parsnips, potatoes, squash, shallots, spinach, turnips, radish, rhubarb, tomatoes.

PRACTICAL RECIPES.

FRIED TRIPE.—Boil one-half pound tripe, cut in small pieces, and fry quickly in butter; fry a chopped onion in butter until brown; add a little chopped parsley and a dash of vinegar; toss lightly and serve at once.

CORN MEAL MUSH.—Stir into a pint of cold milk, one pint corn meal and a teaspoonful salt, and then pour the milk gradually into a quart of boiling water, stirring the whole thoroughly; boil half an hour, stirring often.

CORN OYSTERS.—One pint grated green corn or one pint of canned corn, two eggs, two grated crackers; beat these ingredients well together, season highly with pepper and salt, and fry in hot lard, dropping in the mixture by spoonfuls.

MRS. C'S LEMON TARTS.—Grate the peel of two lemons and squeeze the juice; beat with three eggs, two cupfuls of sugar, butter the size of an egg; stir it over a slow fire until it thickens; make puff paste shells, fill with the jelly and serve.

PRUNE PUDDING.—Soak three-quarters pound prunes over-night; let them boil slowly till quite tender with one cupful sugar; remove the stones, whip very stiff whites of three eggs, stir in and bake slowly; make a custard of the yolks with one pint of milk and serve as sauce; serve pudding hot.

CALF'S LIVER STEWED.—Lard a calf's liver with long strips of fat pork, seasoned with pepper, salt, a dash of allspice, some chopped parsley and grated onion; fry brown on both sides in butter; make a gravy in the pan the liver has been fried in with flour and stock; return the liver with seasonings, a few slices carrots, a few small white onions and a bunch of parsley; cook gently for about two hours and serve.

POTATO RISSOLES.—Boil a small quantity of chives for a few moments; drain and chop very fine, with pepper and salt; beat up three cupfuls mashed potatoes with enough milk to soften it; add three tablespoonfuls melted butter and mix in the chives; bind with a beaten egg, form into rolls and fry in boiling lard.

POTATO ROLLS.—Mash two fine baked potatoes through the colander; to this add two well-beaten eggs, three tablespoonfuls sweet lard and three of butter, one cupful of milk with half a yeast cake dissolved in it, one tablespoonful of sugar and one quart of flour; set to rise for three hours, then add two cupfuls more flour, and let rise for five hours longer; turn out on the bread board, add just enough enough flour to keep from sticking; roll out, cut, place in baking pans; set for two hours longer and bake in a quick oven.

DAMPNESS.

ITS UNIVERSAL PREVELENCE AND IMPORTANCE.

It is not to be wondered at that the ancients regarded water as one of the elements of which all things are composed; for it is a truth demonstrated by modern chemistry that almost all natural objects contain a large proportion of water. Not only the plants that drink the summer showers, and show by their juicy succulence that they have incorporated the liquid streams into their substance, but the very soil in which these plants grow, and the solid rocks themselves, contain a large proportion of water. And when we take away from animals, and even from man himself, the water which they contain, the amount of solid residue left behind is surprisingly small It is true that in all these cases our senses give evidence of the presence of water, and do not require the corroborative testimony of chemical analysis. The moisture adhering to soil and to rocks, the juice of plants, and the blood and other fluids present in animals, all evidently acknowledge water as one of their chief constituents and testify plainly to the presence of this liquid. But if we were to suppose that water is always absent from those substances which to our senses, give no evidence of its presence, we should commit a great mistake. The dry and solid rock consists largely of water; and clay, though baked in the summer sun and dried in the summer breeze, cannot be robbed of all its moisture. When the washerwoman buys fourteen pounds of transparent and apparently perfectly dry soda, she in reality pays for nine pounds of water, and gets but seven pounds of real soda, instead of the fourteen that she supposes she is getting. In short, water is present everywhere—in the dry wood that has for years formed our furniture, and even in the apparently perfectly dry dust that blows about our streets. Even the air on a dry and sultry day when everything is parched and when every breath seems to burn our throats, is charged with moisture. That warm and apparently dry air contains moisture is easily proved. An ice pitcher becomes covered with dew, not because the pitcher sweats though from the inside as it it said to do, but because the water held in suspension by the hot air, even when apparently dry, contains s considerable amount of moisture. Procure a small quantity of salt of tartar, a cheap drug that may be obtained from any apothecary, and, on a dry day, lay it on a common plate and expose it to the atmosphere. In a short time it will have attracted from the air an amount of water sufficient to dissolve it, and it will have become converted into an apparently oily liquid, called by the old chemists who did not fully understand the changes that take place, oil of tartar. The experiment will be more convincing perhaps, if the salt with its containing vessel —which in this case, however, should be as light as possible—be placed in the pan of a moderately delicate pair of scales, and carefully counterbalanced. In this case the abstraction of the moisture from the air is rendered evident by the gradual increase in which weight of the salt and the descent of the pan in which it is placed. If

CASH CURRENT.—"Dear," said a physician's wife, as they sat in church, "there is Mrs. Goldberg sitting in a draft." "Never mind," said her husband, "I will cash that draft later on."

CEYLON COTTON.—The manufacture of cotton goods in Ceylon has for the last few years made remarkable progress. The island promises to become as dangerous a rival to India in that industry as in the cultivation of tea.

then, moisture may be regarded as everywhere present, it becomes a nice point to determine when anything, such, for example, as the air we breathe, our houses, beds, clothes, etc., may be considered damp. To look for perfect dryness would be a vain search; nor would it do us much good if we could find it. Perfectly dry air would remove the moisture from our bodies so rapidly that we should wither as if smitten with the blast of the simoon. In such an atmosphere our throats would be parched as if in an oven, plants would wither; and nature become one universal desert. But on the other hand, air that is too moist—that is to say, air that is really damp—produces effects that is really disastrous. In such an atmosphere, metals rust or corrode, vegetable matters rot, and the growth of fungi, such as mil dew, mould, etc., is greatly promoted. Air in this condition is universally regarded as unwholesome; and it consequently becomes an important practical question to determine when our dwellings are really damp, and to distinguish between this condition and that in which bodies may be considered as ordinarily and properly moist. Theoretically, the question is one that is not easily solved; but practically, it is not so difficult. Let us consider the case of the air; and find out, if we can, what the conditions are in which it may be said to be damp. When perfectly dry air is brought into contact with bodies containing water in a free state, there instantly begins a strife for the possession of the liquid. Since water evaporates at all temperatures, even when it is frozen solid, the air surrounding the moist body becomes loaded with vapor, and, as it then gradually mixes with the air in its neighborhood, its place is supplied with drier air, until the whole air contained in the room or vessel has been saturated with water. The point at which this saturation occurs depends chiefly upon the temperature of the atmosphere. On a warm day the air is dry, not because there is little or no water present in it, but because, owing to its high temperature, it is capable of receiving and retaining a considerable additional quantity of moisture. In other words air and everything else is capable of holding in its substance a certain definite quantity of water. If the amount of water present is so great that it appears in the form of moisture, or if the proportion approaches the limit which the body is capable of holding even before it becomes evident to our senses, we call it damp. Absolute dryness, then is to be carefully avoided, and so is that degree of moistness in which objects part easily with the water which they hold. The evil effects of the first condition are to be seen in the dry and oppressive condition of an atmosphere heated by a stove or furnace, the results of an excess in the opposite direction are most clearly seen in unwholesome basements and damp and malarious cellars. The best means of determining and regulating the amount of moisture in our dwellings is an important one.

THEORY AND PRACTICE.

A MIND HEALER CONFRONTED WITH HIS OWN THEORY.

A Christian Scientist, whose time was fully occupied in thinking about the unreality of disease at two dollars per think, once treated a highly unappreciative man for a chronic nervous affection of a very painful character. After this man had depleted his purse by spending $40 thus, without any improvement, he desired to know when he should begin to get better. Then the Christian Scientist waxed wroth and said: "Oh you of little faith! Know that you would already have been cured, if you had believed me when I told you that your pain was not real. Pain and suffering do not exist; they are merely phantasms of the brain. There is no such thing as matter," continued he, with such emphasis that he rattled some silver dollars in his pocket, "none, whatever; the only real thing is thought. All this is too subtle for your commonplace mind, and hence I can do nothing for you; you had better go and fill your coarse, unappreciative system with drugs." Then a vision of $40 that had vanished, and of pain that had vanished not, came before the mind of that long-suffering man, and he arose, and took that Christian Scientist, and he mopped the floor with him, smiting him sore upon the head and back, so that, when he was through, congestions, abrasions, contusions, incipient ecchymoses and epistaxis were among the phenomena presented by his Christian countenance. "There is no real suffering," said the unappreciative man, with scorn; "the bruises of your alleged head are entirely hypothetical; the choking I gave you was simply an idea of mine, and a devilish good idea, too; the pain which you feel is merely an intellectual phantasy, and your nose-bleed is only one of the ideal conceptions of the cerebral mass. Believe these things not to exist, and they vanish. Good day, sir." And the patient departed.—*Medical Visitor.*

WIDE PLANK.—"The widest plank on earth" is on exhibition at the railroad depot in this city. It was cut at the Elk River Mill, and is sixteen feet in width. It will be among the Humboldt exhibits at the World's Fair in Chicago.—*Humboldt Standard.*

POPULATION OF THE GLOBE.—The latest estimate makes the population of the world 1,440,000,000, of whom the semi-civilized Mongolians number 630,000,000, the civilized Aryans 545,000,000, the negroes 150,000,000, the Semitic or Jewish people 65,000,000, the Malayans and Polynesians 35,000,000, and the North American and South American Indians 15,000,000.

FAST TRAVEL.—A special train, bearing 150 Pennsylvania editors, was run on the 15th July from Baltimore to Washington at an extraordinarily fast gait. It left Baltimore at noon, and thirty-five minutes later had travelled forty-two miles and was in the Washington station. The speed averaged seventy-two miles an hour, or, allowing for starting and stopping, at least eighty miles for the greater part of the run.

ORIENTAL AMENITIES.—Travelers on the Eastern Bengal Railway have placed before their eyes on entering the stations of the road a placard containing the following cheerful information: "Passengers are hereby cautioned against taking anything to eat or drink from unknown persons, as there are many who live by poisoning travelers. They first of all court acquaintance with passengers in a *sarai* or some other place, and then gain their confidence on the plea of being fellow-travellers going to the same place. When they reach a place convenient for the purpose, they poison the water or food of the passengers, who become insensible, and then they decamp with all their property. They also at times poison the passengers' water when being drawn out of wells, or sweetmeats brought from the bazar, or food when being cooked."

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CONTENTS.

COMFORT TO SMOKERS.

Friends of the nicotian weed can take courage from the indorsement given to tobacco smoking by a Georgia physician named Holmes, who evidently looks upon the habit as endowed with all the virtues of a veritable microbe killer. Dr. Holmes, who hails from the Georgian Rome, declares himself as follows: "Smoking is not such an injurious and dangerous habit as has been claimed. All diseases are caused by germs; there can be no life except what comes from life. A person who smokes uses one of the best germicides and antiseptics; he is protected from the invasion of disease, and is, as a matter of fact, less liable to contract disease than the man who does not smoke. During the war I was in charge of over five thousand soldiers at the post in Florida; there were marshes near by, and the dysentery broke out among the troops, raging with great virulence. I noticed that all the Irishmen, who went about with clay pipes in their mouths, didn't contract the disease. I smoked all the time and was free from it. So that smoking, instead of being objectionable, is in reality a good protective against disease, and then there is so much comfort and satisfaction in it that really the benefit is great. I have always smoked and believe it is a good thing. There is at least food for thought in its utility as a prophylactic against disease."

CENSUS CONCLUSIONS.

Some interesting points in relation to the census now being prepared for publication are embodied in a recent letter from Congressman Cummings to the New York *Sun*. Mr. Cummings describes the methods of working up the aggregates of the enumeration, and gives some amusing illustrations of answers to questions of a quasi impertinent nature. The mortgage question in Indiana received from a farmer, who had bonded his 120 acres, the reply that the lien was given "for two sets of false teeth; value, $140." A North Carolina farmer, with a mortgage upon 600 acres, said that "the money was used to pay for niggers purchased by his father before the war." A Kansas farmer returned the following: "Mortgage made to pay debt incurred in business consequent upon the damnable contraction of the currency." A poor widow in Tennessee mortgaged her home for $13 in 1888 to pay the funeral expenses of her husband. The amount unpaid on January 1, 1890, was $7.95. The complaints of fraud in the enumeration came from about fifty towns, and most of these were in the Northwest. Special agents were sent to some of the districts, and in others a recount was ordered. In Minneapolis there was a great amount of padding. But there were ways for discovering the frauds and mistakes that those engaged in them left entirely out of the account. One is to compare the returns with the insurance maps, which give plots of all the occupied and vacant lots in the city, and denote the material of which the building is constructed and purposes for which it is occupied. The enumerators found themselves in a trap. One enumerator reported that there were 2,160 inhabitants in his district. He returned 980 of them as residing on what the insurance maps show are vacant lots. Another enumerator reported that 37 persons resided in a certain house. The map shows that the house is so small that the 37 would have an average of a little less than eight square feet of space apiece. Over 12,000 names were struck from the Minneapolis list as absolutely fraudulent. A year ago the Census Bureau occupied one room, and consisted of the Superintendent, a clerk and a messenger, Now it has about thirty-eight hundred employes, more than half of them girls. It is expected that the enumeration will be completed by the 1st of October. Nine-tenths of the returns had been received up to the middle of last week, and the remainder are probably now in hand. The system of counting by machinery, described in another place, is characterized as absolutely infallible, and color, sex, health, avocation, age, civil condition and all other points are brought out clearly and without error. In the special departments many curious and unexpected facts are discovered. Thus, in the Indian Division it is becoming evident that Oklahoma, with the addition of the Cherokee strip, will have 200,000. On the Indian Territory are points where thousands of white men are grouped. Indians are found by hundreds in Maine, New York, Mississippi and Florida—in the last two States fugitives and stowaways from the Creeks and Seminoles. One curiosity of the Census Office is the file of each census which has been kept, and in it the name of every person living in the United States at the decennial period is recorded. It is to be hoped that the compilation and publication of the census of 1890 will be pushed forward rapidly. Some of the volumes of the census of 1880 were not printed until last year, and some were hardly worth the time and cost wasted upon them.

MEXICAN MINES.

In view of the advertising which makes its appearance from time to time, for the disposal of investments in Mexican mines, some points given recently by a Chicago contemporary are interesting and worthy of being generally known. Being interested in the trial of an important case recently, where a stockholder's liability was being enforced, he discovered—1st, that the title to mines in Mexico never vests absolutely in the holders, but is held conditionally only; 2d, that Mexican mines cannot be worked at a profit by Americans, no matter how rich the ore, for the reason that the Mexican Government places an export duty upon the metal almost equal to its value. The company referred to was obliged to abandon rich bearing mines after expending $200,000 in their development and in building mills, simply because under Mexican law the metal could not be disposed of at a profit.

ELECTRICAL FRAUD.

An alleged "electrical" humbug is exposed by the *Popular Science News*, which is deserving of notice on account of the originality displayed by its projector. It is alleged to consist of a series of steam boilers connected with powerful dynamo machines in such a way that the electric current produced by them is transformed into heat, which is used to produce steam in the boilers and set engines in motion, which, in their turn, operate the dynamos, thus completing the circle of transformations of energy. It is claimed that the apparatus, when once started, will not only run itself, but produce a surplus of power which can be used for industrial purposes. This brilliant scheme would have a very plausible appearance to one unacquainted with the prin-

ciple of the conservation of energy, but it is a scientific and mathematical impossibility. No power can possibly be produced without the expenditure of energy previously stored up, and there is no better or cheaper way of doing this than by the burning of coal, in which the radiant energy of the sun, stored up in past geological times, has been awaiting the coming of man for countless ages.

A BLESSING FOR THE BOYS.

The day of doom for the cigarette-smoking or tobacco using boy in this State is fast approaching. On and after the first of September it will be unlawful for any "child actually or apparently under sixteen years of age" to "smoke, or in any way use any cigar, cigarette, or tobacco in any form whatever, in any public street, place or resort." This law appears to be sweeping enough, though some discretion is given to the enforcers of it in that they are to determine whether a child is or is not "apparently" under sixteen. A youthful looking lad of seventeen or eighteen may easily find himself under the ban. The moral effect of the law cannot but be good, but its enforcement is a matter as to which doubt will prevail more or less widely.

COLORS.

A PRACTICAL ANALYSIS OF PIGMENTARY COMBINATIONS.

The great chemist, Michael Eugene Chevreul, who recently died at the ripe old age of 103 years, terms his research in the realm of colors as the philosophy of natural phenomena. About all the knowledge we possess in this vast and beautiful field is due to this grand old man. Chevreul's genius has demonstrated that the harmonies of color are submitted to immutable laws which he has revealed, and the certainty and fruitfulness of which he has demonstrated by calculation. There are but three primary colors generally recognized—blue, red and yellow. These are called primary because they cannot be produced by compounding any other colors. Then we have the secondaries—green, purple and orange. These are called secondaries because blue and yellow make green; red and blue, purple; red and yellow, orange. From these we derive the tertiaries—olive, citrine and russet. Purple and green make olive; orange and green, citrine; purple and orange, russet. Thus we have the three classifications denoting all the colors proper extant. From these are derived the hues, tints and shades. A hue is obtained by the combination of any of the primaries. The hue may vary according to the predominating influence of one color over another. To obtain a "tint" we simply add white to any of these colors; and to form a "shade" we add black or any of the dark colors. So from the above we have the alphabet of colors. The variety of tones, tints, hues or shades to be obtained from this alphabet are as kaleidoscopic in their possibilities as the alphabet of letters. The hand of man or the skill of the artist will never exhaust them. We have still another term we use in relation to colors which bears its own significance also, and that is "tone." While we have our three primaries to start from, yet we have no standard "tone" from which we shall start our secondaries. There are many different kinds of red, yellow and blue, and we signify the difference as "tones," the same as we apply the term to different instruments of the same kind. You will say that this piano has a much better tone than that piano. So we will find in selecting our primaries. While some of the "high-toned" reds will produce a much more beautiful tint, yet they are too fugitive to use for exterior house painting; so, too, with the greens and yellows, while some are quite permanent. Below we give a list of formulas for mixing colors which will be of service to the amateur house painter and to ladies who decorate their own "bric-a-brac."

French Red.—This color is simply Indian red, lightened with vermilion and glazed with carmine.

Chocolate Color.—Add lake or carmine to burnt umber; or take Indian red and black to form a brown; then add yellow to bring about the desired shade.

Yellow Lake.—Take of umber and white equal parts and Naples yellow and scarlet lake; glaze with yellow lake.

Olive Brown.—Mix one part of lemon yellow with three parts burnt umber. Change proportions for different shades.

Clay Drab.—Raw sienna, raw umber and white lead, equal parts; then shade with chrome green.

Bismarck Brown.—Take carmine, crimson lake and gold bronze, and mix together. If a light shade is desired, use vermilion in place of carmine.

Jonquil Yellow.—Mix flake white and chrome yellow and add vermilion to carmine.

Medium Gray.—Eight parts of white to two of black.

Lead Color.—Eight parts of white, one of blue, and one of black.

Light Buff.—Yellow ocher, tinted with white.

Deep Buff.—The same, with the addition of a little red.

French Gray.—White shaded with ivory black.

Gold Color.—White and yellow, shaded with red and blue.

Pearl Color.—White, black and red in proportions to suit taste.

Canary Color.—Five parts white and three parts lemon yellow.

Oak Color.—Five parts white, two of yellow and one of red.

Olive Color.—Eight parts of yellow, one blue and one black.

Snuff Color.—Four parts of yellow and two of Vandyke brown.

Rose Color.—Five parts of white and two of carmine.

Bottle Green.—Dutch pink and Prussian blue for ground; glaze with yellow lake.

Salmon Color.—Five parts white, one yellow, one umber, one red.

Brown.—Three parts of red, two black and one yellow.

Copper Color.—One part red, two of yellow and one of black.

Lemon Color.—Five parts of lemon yellow and two of white.

Straw Color.—Five parts of yellow, two of white and one of red.

Fawn Color.—Eight parts of white, one of red, two yellow and one of umber.

Flesh Color.—Eight parts of white, three of red and three of chrome yellow.

Chestnut Color.—Two parts of red, one of black and two of chrome yellow.

Wine Color.—Two parts of ultramarine and three of carmine.

Green.—Blue and yellow or black and yellow.

Maroon Color.—Three parts of carmine and two of yellow.

Tan Color.—Five parts of burnt sienna, two yellow and one raw umber.

Pea Green.—Five parts of white and one of chrome green.

Stone Color.—Five parts of white, two of yellow and one of burnt umber.

Citron.—Three parts of red, two of yellow and one blue.

Drab Color.—Nine parts of white and one of umber.

Lilac.—Four parts red, three white and one blue.

Purple.—The same as lilac, but differently proportioned; say two parts of blue.

Violet.—Similar, but more red in than purple.

Cream Color.—Five parts white, two yellow and one red.

Claret.—Red and black, or carmine and blue.

Dove Color.—Red, white, blue and yellow.

Light Gray.—Nine parts white, one blue and one black.

Willow Green.—Five parts white, two verdigris.

Peach Blossom.—Eight parts white, one red, one blue and one yellow.

Bronze Green.—Five parts chrome green, one black and one umber.

Carnation Red.—Three parts lake and one white.

Grass Green.—Three parts yellow and one Prussian blue.

Brick Color.—Two parts yellow ocher, one red and one white.

Portland Stone.—Three parts raw umber, three yellow ocher, one white.

Plum Color.—Two parts white, one blue and one red.—*S. Paris Davis, N. W. Builder and Decorator.*

THE NEW GAS GUN.

TRIAL OF THE MARVELLOUS RIFLE INVENTED BY M. GIFFARD.

The London *Daily News* of July 17 says: "At the head-quarters of the London Scottish Rifles yesterday afternoon, some interesting experiments were conducted with M. Paul Giffard's appliance for the employment of liquefied gas as an explosive—or, to be more strictly accurate, one should say as a means of propelling projectiles—in the place of gunpowder. M. Paul Giffard's scientific reputation as inventor of the pneumatic tube, and of the "Giffard injector," so largely used in connection with steam power, stands so high that any invention to which his name was attached would be worthy of attentive consideration. The weapon now introduced by him, however, is something more than an ingenious appliance; it is a discovery which not only promises to revolutionize the gunmakers' art, but is applicable also to many other purposes as a motive power. Those who are interested in the Giffard gun claim that it is the military weapon of the future. The idea of using liquefied carbonic acid gas as a propulsive power is not new, but M. Giffard is the first who has turned it to practical account. The gas gun is a model of simplicity, so far as one can judge without examination of the discharging mechanism, in which much of the merit of M. Giffard's invention lies. A small cylinder, called a cartouche, is attached to the barrel of a rifle or smoothe-bore gun. This cylinder contains liquefied gas enough to discharge 220 shots, equal to about 50 bullets of the ordinary service rifle, with a velocity sufficient to kill at 600 yards. There is no other explosive. The pellet is simply dropped into an aperture of the barrel, which is hermetically closed by pressing a small lever, and the loading is complete. When the tricker is pressed a small quantity of liquefied gas becomes released and expands in the breech chamber. There is no louder report than the drawing of a champagne cork makes; no smoke and no fouling of the barrel. In all these respects M. Giffard's gas gun seems to fulfil the requirements of an ideal weapon for warfare; but whether in other respects liquefied gas has advantages over ordinary explosives for military purposes remains to be proved. The inventor says there would be no difficulty in refilling the cylinders with gas on the battle field; but it is obvious even if that be the case that the reserve cylinders would have to be supplied to each man, in order to make up the number of rounds now thought to be necessary; and as bullets would of necessity be carried in additiou, the amunition for a gas gun would weigh just as much as ordinary cartridges, weight for weight. According to the *St. James's Gazette*—"The charge of liquid liberated for each round is regulated by a milled screw, and each charge as liberated, is contained in a special chamber, from which it is released by the pulling of a trigger. The bullet is dropped separately into an orifice in

the breech-lock. In the rifles shown, the bullets were round, but elongated bullets can be used. When the guns were discharged a rush of vapor was seen issuing from the muzzles. But it instantly faded away and the bullets flew with strict precision to the targets. Barrels which had been repeatedly discharged in the past two months were shown to have suffered no corrosion. The pressure of the gas and fluid in the above magazines was 500 pounds on the square inch, and this pressure is maintained up to the last drop of fluid. The preparation of the liquefied gas involves no mechanical power; but the needful pressure is got entirely by the chemical manipulation of ordinary substances, such as carbonate of soda."

BATRACHIAN VORACITY.

SOME PRACTICAL POINTS ABOUT FROGS AS EATERS AND AS EATABLES.

A gentleman who owns a pretty farm in Morris county, N. J., recently took a representative of the Newark *Sunday Call* over his place and lingered on the banks of a trout pond, which is his special pride. Sitting in plain sight on the bank was an enormous bullfrog. "What is he doing there?" asked the newspaper man. "Oh, he is one of my pets," said the farmer. "There are four of them, all about the same size, and it would amuse you to hear them talking to each other at night. I like their music and will not let anybody kill them. The Italians on the water works job are ridding the surrounding country of all the frogs, and twice I have caught them in here after these with a stick and a red rag on a hook." "Pretty expensive pets," said the visitor. "But, then, I suppose you can afford to indulge in luxuries." "How are they expensive?" asked the amateur trout culturist. "Well, I should figure that each of these frogs has cost you about 25,000 young trout in the last three years, and may be twice the amount. Anyway, you can safely put it at 100,000 trout for the four of them since you have had the pond." "Nonsense. Frogs do not eat trout. They live on flies and insects. I have seen them eat them often." "Come, now, let us dissect this big fellow, and if we do not find other than insect food in his paunch you may say that I have libelled him, and I will replace him with two frogs fully as big as he is." "You needn't do that, for I am willing to believe that you know what you are talking about," said the farmer, and taking up a stick he stretched the frog dead. In the stomach of this particular frog was a young trout an inch and half long, a small striped dace, a dragon fly and some half-digested animal matter which could not be identified. Satisfied that the frogs were enemies of trout, the farmer killed two others which were in sight, and in each were found several young fish, The fourth frog was not in sight then, but later in the day he was seen on the shore of the pond, high up in the grass, and a whack with a cane ended his existence. In his stomach were found a mass of catterpillers such as are found on the bottom bushes which grow on the edges of ponds and streams. A further search was made, and half a dozen small frogs were taken out of the pond that afternoon and summarily dispatched. A water-snake was killed during the search for the frogs. The farmer knew that he was a trout eater, having seen him on a previous occasion with a yearling fish in his mouth. "What do frogs eat?" is an interesting question. A full-grown bullfrog will stop at nothing eatable, even, though, it is apparently as large as himself, and he will show unexpected dexterity in catching it. The stories about frogs eating young ducks are not fables. They have not only been seen to pull down young ducks, but have been killed with the ducks in their stomachs. The writer caught a frog in the Passaic, at Singac, a few years ago with a piece of red flannel on a hook, and on opening the reptile found that its stomach was distended with an enormous fresh-water mussel. The process of digestion had gone on far enough to remove the black outside of the shell in places, and show the pearly lustre beneath. On another occasion he opened a large frog and found in it a small mud turtle not yet dead. In addition to the turtle were two half-digested crawfishes. The frogs in the upper Passaic feed largely on crawfish, and are frequently found with their stomachs distended with them. This proves that they occasionally feed under water, and the presence of fish in their paunches even more conclusively shows that those who have contended that frogs take their food in the air only are wrong. Ben Holbrook, of West Milford, tells an interesting story about a frog he once saw. He thought that it was being swallowed by a snake, and as the frog was a large one and the snake only eighteen inches long and no thicker than Ben's thumb, he went down from his buggy to watch the outcome or "ingo" of the struggle. He saw in a moment, instead of the snake having the frog, the frog had the snake and was trying his best to swallow it. Ben looked on for ten minutes, and finding that the frog was making no progress he killed the snake with his whipstock. The frog immediately opened its mouth and spat out the snake's head. Ben then killed the frog too, and took both reptiles over to Dr. Marsh, who could not be made to believe the story. The story of the frog swallowing an egg and then jumping hard enough to break the shell is probably a fable, but the swallowing part need not be doubted. Frogs have been known to eat the eggs of marsh birds and of turtles, but it is not necessary for them to break the eggs to get at the nourishment. The digestive apparatus of a reptile which can eat mussels, shell and all, certainly is not to be disturbed by an eggshell. Bullfrogs are good eaters, though not particular about their food. They are good eating also, not only the hind legs, but every particle of flesh on their bodies. The hind legs are eaten and the rest discarded because there is little flesh elsewhere on the frog, his forelegs and body being pretty poor picking. Other frogs besides the big bullfrogs are good eating in spite of the prejudice which many persons have against the striped frogs found in the brooks and the yellow-legged frogs from the salt marshes. In February the meadow frogs are caught at wholesale by boys who rake them from the mud where they lie torpid until the ice goes away. Not many years ago frogs were despised as food in this country, and nobody but a Frenchman could be induced to eat them. Now there is a steady demand for frog legs in all city markets, and the price is less than fifty cents a pound. Frog-catchers find no difficulty in selling their catch to dealers at this price, and in the summer they get the full retail price from the hotel-keepers. Frogs are in their best condition in July and are poorest in April, when many persons regard them as being unfit for food. Artificial hatching and frog farming has been tried again and again, but has always failed because of the impossibility of procuring proper food for a large number of frogs confined in an enclosure. The only way that frog culture may ever succeed is by having a square mile or so of marsh lands properly detatched for them. Then it must be inclosed so that when the frogs take a notion to migrate they can not get away, and a reasonable amount of protection must be given them, as they have countless enemies in the air and on the ground.

SHAKING HANDS.

THE LATEST EVOLUTION OF AN ANCIENT CUSTOM.

We are more given to shaking hands than other nations. Where the Frenchman or the German would content himself with a comprehensive bow that includes a whole company of people in one courteous sweep, the Englishman especially if he is country bred will patiently and perseveringly shake hands with every one who is present. Perhaps it is owing to a feeling that an unnecessary use of the practice is provincial that we may trace a visible decline in it at the present day. But it is difficult to say to what cause is attributable the present extraordinary form which it takes among certain people when they do practice it—a form which is especially prevalent among those people whose ambition it is to be known as "smart." When two members of this class, or of the far more numerous class that imitates them, meet each other, they go through a ceremony which certainly bears a faint resemblance to that of shaking hands but it is in all real essentials absolutely different. The lady lifts her elbow as high as her tight sleeve will permit her, and dangles a little hand before her face, carefelly keeping the wrist as stiff and as high as possible, while she allows the fingers to droop down. The man contrives to lift his elbow a little higher, and by a dexterous turn of the wrist touches her fingers—that is all. The reason assigned for this is curious. It is said that ladies who are bidden to court, and whose privilege it is to exchange greetings with royal personages find it difficult to combine a courtesy with a shake of a gracious hand with out raising their own hands to the level of their faces. Hence their too frequent communications with illustrious people have corrupted their good manners; they acquire a habit, and are so forgetful as to introduce it into their ordinary life and their relations with more ordinary people. But they forget the courtesy, while they forget to remember to lower their hands. Another reason that has been suggested for this greeting, as it is practiced by the best society, is that they have borrowed it from the coachman. With his reins in one hand and his whip in the other, the only approach to a salutation that a coachman can make is by a sharp upper movement of the elbow and whip hand. Indeed this explanation is very plausable, for there is a kind of natural affinity between the manners of the stable and those of the very smart people. How ancient a custom is the shaking of hands no one can say. The giving and clasping of right hands had its origin most probably in a wish to show that the right hand was unarmed, and that no danger need be apprehended from its owner. There is evidence to show that the clasping of hands was an ancient Hindoo usage in legal transactions, as it was also among the Romans in such matters as a marriage contract. As a mode of salutation it certainly existed among the latter; for we have Horace's description of a bore:

Arreptaque manu, "Quid agis, dulcissime rerum?"

The modern idea of the science of politeness is a science that will save time. No one would wish to bring back the stately obeisances, the sweeping courtesies, and the hollow compliments of last century. But at least they were a pretty comedy while they lasted, whereas this last fashion of hand-shaking is a grotesque farce.

NOT A BIT.—"How much are your oranges, my little man?" "Ten cents, sir." "What—apiece?" "No, sir; a whole un."—*Harpers' Weekly.*

ACKNOWLEDGE THE CORN.—In 1828 Congressman Alexander Stewart said in a speech that Ohio, Kentucky and Indiana sent their haystacks, cornfields and fodder to New York and Philadelphia for sale. Mr. Wickliffe, of Kentucky, called him to order, declaring that those States did not send their haystacks and cornfields to the Eastern cities for sale. "Well, what do you send?" asked Stewart. "Why, horses, mules, cattle and hogs." "Well, what makes your horses, mules, cattle and hogs?" queried Stewart. "You feed one hundred dollars' worth of hay to a horse. In doing that you just animate your haystack and get on top of it and ride it to market. How much corn does it take to fatten a hog, Mr. Wickliffe?" "Thirty-three bushels," replied the man from Kentucky. "Then you just put thirty-three bushels of corn in the shape of a hog, and walk him off to market," said Stewart. At this point of the debate Wickliffe sprang to his feet and exclaimed very hurriedly, "Mr. Speaker! Mr. Speaker! I acknowledge the corn." The incident caused quite a laugh among the members and was never forgotten.

CENSUS COUNTERS.

MACHINES THAT BEAT THE HUMAN BRAIN IN COMPUTING RETURNS.

Nice-looking girls in clean, white aprons are the busy hands in a machine shop on the third floor of a Ninth street building, writes a Washington correspondent. It is the census bureau, and the girls work on those wonderful counting machines, which come so near human intelligence in computing the returns sent from all sections of this big country for the census of 1890. At first glance the machines remind one of upright pianos. They have handsome oak cases and each one occupies about the same space a piano does. They are, however, eminently practical machines, and with their aid some fifteen young ladies can count accurately 500,000 names a day. It is expected that when the work of counting the census returns really begins that there will be seventy or eighty of these machines at work. The returns from the census districts throughout the country are coming in slowly. There are more than 50,000 of these districts, and so far only about 2,500 districts have sent in returns. As fast as the returns come in they are counted, although not as rapidly as they will be, as it is necessary to train the young ladies in the use of the machines. In making this count which is known as the "rough count" the returns for each district are counted twice. After being counted on one machine they are passed over to another, and when the latter count is completed the two are compared, and if there are discrepancies necessary corrections are made. Following this method if the total population of the country is 60,000,000 there will be counted in the census office an equivalent of 120,000,000 names. The machines which are the invention of Mr. Hollerith, and supplement his tabulating machines, are very simple. A keyboard resembling that of a typewriter, is at the right of the operator. Each key has a number from one to twenty. The operator has a pile of census schedules at her left side, and as she turns the schedules over, she notes the figures which indicate the number of members in each family enumerated in that schedule. If there are five in a family she strikes the key marked five. When a key is struck an electric connection is established with the hands on a dial in the frame work in front of the operator. That dial is marked No. 5, which means it records the number of families consisting of five persons. Each time the No. 5 key is struck No. 5 dial records one. When the count is completed the recorded number on each dial is multiplied by the number of the dial, the results added up and the total number of individuals in that district is ascertained. If the same result is obtained by a different operator, then it is concluded that the count is correct. It is expected that by the use of these machines the results of the census will be known much sooner than by any other known method.

ANTIQUITY OF THE PIPE.

ITS USE KNOWN FOR MORE THAN TWO CENTURIES.

The good people in Leipsig are about to celebrate in public rejoicings the bi-centenary of the pipe. But why its bi-centenary? Surely its use is of much older date than 1690. Pipes were found long before that date in ancient tombs and old lacustral strongholds. There are even prehistoric pipes, a curious specimen of which can be seen at the Campana Museum. Our remote ancestors, it is true, did not smoke tobacco, but they smoked a preparation of hemp, dried sage and chestnut leaves. Surmounting the capital of a pillar in an old Roman church near Leboeuf, in Normandy, which dates from the twelfth century, there is a sculptured figure of a man smoking a pipe. This quaint figure, in attitude really not unlike a Normandy peasant of today, smoking the pipe of peace at his cottage door, has been the subject of grave polemical discussion between archaeologists, provoked by M. Paul Eduel, the well-known antiquarian. It has been definitely settled that this interesting figure, from the pertinent historical point of view, dates from the time of the building of the church; and therefore it is pretty certain that as early as the twelfth century there were people, at all events in Normandy, who took a delight in having a tube between their lips and inhaling smoke. We all know that when Christopher Columbus discovered America the pipe was highly prized by its uncivilized inhabitants. There was not a single Indian tribe which did not smoke the pipe of peace. There are also to be found in private collections curious specimens of elaborately carved pipes, which date from the time of the conquest of Mexico. Some of these were considered as holy emblems, being covered with religious inscriptions and drawings. M. de Watteville, an ex-director of public instruction in France, who has formed a highly curious and interesting collection of pipes of all periods, picked up on one occasion in a country carpenter's shop a pipe of Aztec origin, made of wood, dating from the time of Montezuma, and delicately carved to represent the combat of Mexican idols. As it bears no resemblance whatever in its curves, either of bowl or stem, to the pipes now in use, this country carpenter had mistaken it for the arm of an old chair. As a rule, the bowls of ancient pipes are very small, as are those of Japanese pipes, which date from a period long anterior to the seventeenth century. An explorer lately brought from the interior of Guiana the bowl of a pipe of uncommon size and singular shape. It is perforated with many holes, and being filled with aromatic herbs, the members of indigenous tribes were in the habit of inserting long tubes in these holes and smoking together in common. In the Caucasus, pipes with two bowls have been found which date from the thirteenth and fourteenth centuries, as is sufficiently proved by the figures rudely carved on a flat surface of these bowls, which are square shaped. We are not aware of any record which proves the use of the pipe in England previous to the legendary story which tells of the maid servant, who coming suddenly on Sir Walter Raleigh smoking a pipe, and believing he was on fire, emptied a pail of water over him, but history has shown that the excentric French Admiral Jean Bard was in the habit of smoking his pipe in the passages of the chateau of Versailles long before 1690; and that during the reign of Catherine de Medicis there were already inveterate smokers of "l'herbe de la reine," imported into Europe by Jean Nicot toward the end of the sixteenth century.—*London Globe.*

SAUERKRAUT.

ITS NUTRITIVE VALUE FROM A SCIENTIFIC STANDPOINT.

Dr. Ignacy I. Piontkowski, of St. Petersburg, has recently published a monograph on the subject (*St. Petersburg Inaugural Dissertation*, 1890, No. 23, pp. 45), based mainly on his own chemical and physiological researches. The latter refer to three varieties of cabbage —the so-called Brunswick, whiteheaded, and winter (*Zimovka*) cabbage, both a chopped and shred sourkraut being examined and experimented with. The following are the main results arrived at by the author: 1. The vegetable is very poor in true proteids, a fresh cabbage containing not more than one per cent., a sour one only 0.7 per cent. 2. A chopped sauerkraut contains a somewhat larger proportion of proteids than a shred one. 3. On long standing sauerkraut gradually looses all its proteids as well as nitrogen in general. 4. The nutritious value of 345 grammes of sauerkraut, is inferior to that of one-half pound of rye bread. 5. The assimilation of sauerkraut is inferior to that of rye-bread. (The proposition is based upon Dr. Piontkowski's experiments on twelve healthy and strong men, mostly prisoners, habituated to a vegetable diet. The assimilation of sauerkraut was found to be equal only to 59.7 per cent. of the food article injected; That of rye bread 65.5; that of white bread 74.3). 6. A thoroughly boiled sauerkraut is assimilated somewhat better than a raw one. 7. All the above statements hold equally true of all the three varieties of cabbage examined.

EXHIBITION BATHERS.

POSING ON THE BEACH IN UNDRESS TOILETS.

According to the Atlantic City correspondent of the Philadelphia *Times*, the number of exhibition bathers who hang their clothes on a hickory limb but don't go near the water is daily on the increase, and during a walk along the beach one can readily pick out hundreds of young girls and even mature dames, arrayed in the most attractive and costly bathing robes, who don't even wet their dainty feet in the surf, but prefer to gaily trip in groups along the strand or gracefully recline on the warm sands. They, as a rule, wear collars and cuffs, dainty little caps, neat slippers, and are invariably tight laced. They are as careful of details in donning this beach costume as if they were dressing for a ball, and certainly appear far more captivating. These fair and frolicsome visitors are known as exhibition bathers, but they don't bathe. A new fad among this particular class is to go carriage riding in their brief attire, and it is a familiar sight on the avenues daily to see a bevy of pretty girls clad in handsome surf costumes urging along a weary beach steed, and evidently enjoying the diversion.

ROMAN STRAWBERRY FESTIVALS.

A SAVORY SUGGESTION FOR THE THIRTEEN CLUB.

Among the many old Roman customs that have passed away with the papal dominion of Rome, are the "strawberry feasts" which used always to be celebrated in that city during the month of June and especially on the thirteenth, when the strawberry season is at its height. On this day all the strawberry gatherers and sellers in and about Rome used to keep a festival, known as "The Triumph of Strawberries.". A large basket was covered with silver leaves and in the centre was placed a statue of St. Anthony, whose festival falls on this day. This is not the celebrated St. Anthony, known to posterity for his love of his pig, whose festival falls on the eighteenth of January, and is the signal that carnival has commenced. This strawberry St. Anthony is called St. Anthony of Padua. All around the statue of this saint, then, the strawberry girls placed smaller baskets of strawberries, the fruit being arranged on layers of silver leaves. The strawberry boys then lifted this large basket, with its contents, on their shoulders and carried it through the principal streets of Rome, beginning at the Campo de Fiori (field of flowers) where now stands the statue of Giordam Bruno on the spot where he was burned to death. Young men and girls, all strawberry gatherers and sellers, danced and sung around the basket containing the statue and strawberries, and accompanied their songs and dances with their tambourines. Like most popular festivals in Rome, even the strawberry festival was a remnant of pagan Rome, when fruits of every description were carried round in silver baskets and offered on Adonis' altar. If it were not for the celebrated Pinelle's drawings of ancient Roman customs, they would most likely pass entirely out of memory; but so long as these last, we shall still be able to recall them into life; if but for the time we gaze on them. Notwithstanding these strawberry festivals, however, strawberries did not enjoy any great gastronomic favor with the ancients. Even the poets celebrated them more as ornaments than as food. Now, on the contrary, besides being most exquisite in

taste, strawberries are acknowledged to be particularly beneficial to health, and especially to those subject to rheumatism and gout. They are also "beautifiers." They whiten the teeth better than any dentifrice, and they soften the skin when used instead of soap. Hence the reason they were used in baths by the coquettes of the last century. As health restorers, strawberries cool the liver and blood and exhilarate drooping spirits. Ulcers may even be cured by being washed with the juice of strawberries. And nothing can be better to relieve red and inflamed eyes than strawberry juice. In fact to bathe the face continually with it will take away any redness of the skin or spots and make it wonderfully clear and smooth. Strawberries make excellent tonic drinks, syrups and lotions, but they are not recommended in fevers. In Rome the small wild strawberry is preferred and is both washed and eaten with wine. Large strawberries, such as we see in England, are unknown in Italy. There is a large strawberry, however, called Ananas in Rome, but it has no flavor. It looks pretty but that is all.

SWEETMEATS.

SOUTH AMERICAN DELICACIES AND FANCIES.

In Buenos Ayres it is the custom to serve sweetmeats at every meal—"dulces," as they are called—preserved fruits of the richest sort, jellies and confections of every variety and description. Many of these are made by the nuns in the convents, and are sold to the public either through the confectionery stores or by private application. A South American housewife, instead of ordering jams, preserves and jellies from her grocer, or putting up a supply in her own kitchen during the fruit season, patronizes the nuns, and gets a better article at a lower price. The nuns are very ingenious at this work, and prepare forms of delicacies which are unknown to our table. At a dinner party not long ago dessert was brought in in a novel form. A tray, which appeared to be filled with hard-boiled eggs, was placed before the hostess, who gave each guest a couple, and poured over them some sort of syrup or dressing. In a strange country the tourist is always on the lookout for odd things, but this seemed to cap the climax—hard-boiled eggs at a swell dinner party for dessert. But it was soon discovered that the white of this bogus egg was blanc mange, and the yolk was made of quince jelly, eggshells being used for moulds. This is an idea of the nuns, and one of their ingenious fixings.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

August.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal, venison.

FRUITS.—Cherries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple, grapes, plums.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, crabs, clams, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, salmon, turtle, trout, sturgeon, whiting, weak-fish, rockfish.

VEGETABLES.—Beans, beets, cucumbers, cabbage, carrots, cauliflower, corn, egg-plant, lettuce, onions, parsley, parsnips, potatoes, squash, shallots, spinach, turnips, radish, rhubarb, tomatoes.

PRACTICAL RECIPES.

PRESSED VEAL.—Take the veal left from the soup, chop it fine, season highly with pepper, salt, and a little grated lemon peel. Press it and serve cold.

CODFISH AND TOAST.—Cut in very small bits a piece of codfish. Pour boiling water over it to freshen it; add fresh water and cook till tender. Pour off the water and add some cream and seasonings. Pour over very thin slices of toast and serve.

RASPBERRY AND CURRANT PIE.—Make a good crust and line the sides of a deep pie dish with it. Place a small teacup upside down in the center of the dish and fill up with equal parts raspberries and currants, using a liberal supply of sugar. Put on a top crust and bake a fine brown.

ASPARAGUS PUDDING.—Beat up four eggs, and to them add one cupful of the tops of asparagus cut into small pieces, six teaspoonfuls flour, half tablespoonful finely-minced ham, a good lump of butter, pepper and salt. Mix well together, and add sufficient milk to make a thick batter. Boil in a buttered mould for two hours. Serve with melted butter.

CORN SOUP.—Cover three pounds veal with water and boil it until the meat falls from the bones. Strain out the meat and add two cupfuls of corn, canned or fresh, a little chopped parsley, pepper and salt. Let it cook slowly for half an hour, then mix together one tablespoonful of flour with one of butter; add to the soup, boil up and serve.

SHRIMPS.—Prepare some flour with pepper, salt and a pinch of cayenne. Put in a frying-pan half teaspoonful of lard, two teaspoonfuls of butter, and six teaspoonfuls finely chopped parsley. Take one cup shrimps, dip them in the prepared flour, throw them into the boiling butter and keep tossing them lightly about untill they absorb all the fat and are done. Then serve very hot on thin slices of buttered toast. Garnish with pieces of lemon.

CHICKEN AND RICE.—Fry four slices of bacon. Cut up a fowl and stew for half an hour with the bacon in two quarts of stock to which has been added a bag of spices composed of the following: Two teaspoonfuls coriander seed, one of cloves, one of allspice, one of mace, one of cinnamon, three of cardamom seed, and one-quarter ounce peppercorns. Add a cupful and a half of rice and stew another half hour. Slice two onions and fry them a nice brown in butter. Turn the chicken out on a dish with the rice arranged around it; garnish with the onion and serve.

THE COMPLEXION IN AUGUST.

A good complexion befits both man and woman. Its value is not so much an element of beauty as an indication of good health. The face is a terrible tell-tale. To the trained eye of the physician or of the man of the world it betrays all the secrets of its owner. If he drinks to excess, it swells and breaks several veins, so as to hang out a red light, or else drives the blood back to the heart so as to produce an alcoholic pallor. If he be an opium eater, it colors the cheeks an unmistakable gray or greenish hue and darkens the circles of the eye. If he be a glutton, it weighs down the eyelids, adds jowls to the cheeks, and increases the activity of the oil glands. As to the effects of habits upon the face, they are too familiar to bear repeating. The look of the scholar, pugilist, criminal, policeman and minister, one and all, is as distinct as can be. More than all these, the face shows the condition of the blood. If it be deficient in quality and quantity, the glands grow inactive, the tissues shrink, and the complexion assumes a dry and death-like appearance. If it be full of impurities, the face indicates it by rashes, boils and eruptions. If half-impure, by pimples, black-heads and prickly heat, Beyond these are the freckles, sores, water blisters, minute wens, expanded pores, fever sores, and fifty other disfigurements by which the face gives notice that the blood is contaminated. No amount of paint or powder, medicated soap, face-bleach, beauty-mask or enamel can change this. These apply merely to the surface and work no intrinsic good. They either drive the humors into other parts of the system, and so occasion sickness, or else they still further injure the appearance and condition of the skin. More deadly and detestable are those preparations of arsenic, mercury, bismuth, antimony, lead, silver and zinc with which unscrupulous and disreputable charlatans pretend to secure beauty of complexion for their dupes, and really inflict injuries which no science can ever atone or make amends for. In the heated season, and particularly August, the impurities of the blood produce their strongest effect upon the skin. On the body it takes the form of hives, prickly heat, summer rash, eczema, and the like; on the face, of pimples, rashes and other blemishes. Yet this is the very season when the opposite condition of affairs should prevail. The temperature opens the pores, excites the glands and affects all the secretive functions. Were the blood then pure and good, the health and the complexion would be at their best. And it should be remembered in this regard that in August bathing, whether fresh or salt, excursions of every sort and kind, fruits and vegetables in endless variety, and the lightest and best ventilated clothing of the year afford every aid to health, strength and comfort. The ugly faces of men and women in the dog days means but only one thing—impurities in the blood which nature, unable to use any other course, is endeavoring to expel through the skin. If the contents of any sore or other blemish on the face be examined, they will be found to consist chiefly of contaminated elements of the blood. When the sore opens or the pimple breaks, the system has been relieved of so much humor and nothing else. This would all be well were it not for the fact that nature and science have better ways of expulsion, and these facial disfigurements, generally painful and unsightly, are absolutely unnecessary. With the use of any true blood purifier these humors are destroyed and dispelled thoroughly. Not only the crimson current is freed from all debris, foreign matter and the decaying or decayed tissue from all parts of the organization, but every part of the system is similarly freed and cleansed. This magnificent performance is accomplished at its best by Ayer's Sarsaparilla. Other preparations may produce certain results, but Ayer's famous compound complies with every condition of physiology and chemical science. Used in August or any other month, it raises the blood to perfect purity, and in so doing cures all the ills which beset the complexion. Of course it is not a preventive for sunburn or tan. These are incidents to the chemical action of sunlight, and are beautiful in their suggestion of health and vitality. They need neither prevention nor cure. But for pimples, rashes, blackheads, boils, and their numberless disagreeable cousins, Ayer's Sarsaparilla is both preventive and remedy. Using it, the full-grown man will have a face that is a pleasure to himself, and the woman one that is always clear and beautiful.

BUSINESS NOTES.

CALIFORNIA CHAMPAGNE.

A late number of the San Francisco *Evening Post* says:

C. F. Oldham, of the London wine firm of Grierson, Oldham & Co., will start for England on Thursday or Friday. During the past few months he has visited all the principal wine producing sections of the State. The cellars of producers and handlers have been freely opened to him, in the hope that the market would be stimulated in the old country. He freely says that of all the wines he tasted the dry wines are among the best suited to the English palate, and those of 1889 are best, as not having staled in the over-dry cellars. Of the sweet wines he thinks less. Regarding the champagnes he says: "I must confess that I came to California full of prejudice against the idea that champagne could be made outside of France, and now that I am about to go to my own country I am equally free to say that this prejudice has been wholly removed. There is really but one champagne producer in California, Mr. Arpad Haraszthy. I am surprised at the excellence of

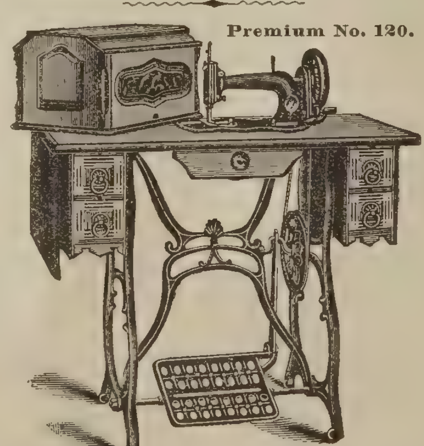
the article which Mr. Haraszthy has shown me, and I shall take samples of his Brut to England to show to experts as samples of what can be done in California. The English people like their champagne dryer than most Americans; for while we drink the foreign Brut almost exclusively, Americans incline to the Sec, or even sweeter kinds. "Haraszthy's young Brut is a marvel of excellence. I can only compare it to the best French champagne, of equal age, and if it is liqueured properly as it is done abroad, when it is three years old it will be fit to be compared to any when it is ready to go on the market. The English demand for champagne calls for a well matured and properly liqueured article. For instance, the 1884 champagnes, which were liqueured three years ago and have been maturing since that time, are only now being placed on the marked. The capital which is required to hold wines this long when the first cost is so heavy is necessarily enormous, and this seems to be one of the difficulties in the way of the fullest development of all California wines, whether champagne, dry wine or fortified wine. I can see no reason, judging from the samples of Brut that I have tasted, why California Champagne should not hold its own abroad. As I say, I compare Mr. Haraszthy's new Brut with the higher grades of French champagne of equal age. Vizetelly, I see, classes it with a middle class Ay champagne."

ARMOUR'S BEEF EXTRACT.

Eight months ago Armour & Co. submitted samples of their Fluid Beef Extract to the U. S. Army Medical Department, and they have been testing it carefully ever since for quality, flavor, keeping properties, etc. Although previously wedded to other brands they have decided that Armour's Fluid Extract is the best, and a few days ago gave Armour & Co. a preliminary order for 1,200 4-oz. bottles. Armour & Co. may well feel elated at the success of their extract, and justly regard the approval of and an order from so critical a purchaser as the U. S. Army Medical Department as a splendid victory.

HORSFORD'S ACID PHOSPHATE.

Makes a Delicious Lemonade. A teaspoonful added to a glass of hot or cold water, and sweetened to the taste, will be found refreshing and invigorating. Dr. T. C. Smith, Charlotte, N. C., says: "It is an invaluable nerve tonic, a delightful beverage, and one of the best restorers when the energies flag and the spirits droop." It relieves the feeling of lassitude so common in midsummer, and imparts vitality. Dr. J. S. Whitaker, Millville, N. J., says: "It has been thoroughly tested, and is especially useful in certain forms of dyspepsia, headache, nervous affections, and in restoring the waste to the nervous and muscular system especially caused by overwork."



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CONTENTS.

ANOTHER POLAR EXPEDITION.

The Norwegian Government has appropriated a considerable sum of money for the purpose of sending an explorer named Nansen on an expedition to the North Pole. He will set out in February, 1892, and hopes are entertained that he will succeed in that perilous quest in which all his predecessors have so signally failed. Hitherto it would seem that all attempts to reach the North Pole have been made in defiance of the obstacles of nature. It has been an open campaign between the endurance of man and the icy barrier of the Arctic Seas, in which nature has always been triumphant. On this occasion a systematic and well organized attempt will be made to ascertain if nature herself has not supplied a means of solving the difficulty, and if there is not, after all, a possibility of reaching the North Pole by utilizing certain natural facilities in these frozen seas of which all earlier explorers were ignorant. The circumstances on which these new hopes are founded may be thus summarized: The Jeannette expedition of 1879–81 and the loss of that vessel seemed to sound the knell of all expeditions to reach the Pole by Behring Straits; but in the end the results of that effort are shown to have been more satisfactory and auspicious than any of the officers of the Jeannette could have hoped for when, with extreme difficulty, they succeeded in reaching Siberia across the ice from their wrecked vessel. In June, 1884, exactly three years after the Jeannette sank, there were found near Julianshaab, in Greenland, several articles which had belonged te the Jeannette and been abandoned at the time of its wreck by the crew, and which had been carried to the coast of Greenland, from the opposite side of the Polar Sea, on a piece of ice. This fact at once aroused curiosity as to how it accomplished the journey across the Arctic Ocean, and as to what unknown current had borne the message from Behring Straits to Greenland. However these objects reached Julianshaab, they could not have come in an eastern direction, through Smith's Sound, for the only current is that from the eastern coast of Greenland via Cape Farewell and the north. Nor is there much probability that they were borne in a western direction from the place where the Jeannette sank, for all the currents round Nova Zembla, Franz Josef Land, and Spitzbergen are known, and it seems impossible for the ice bearing the relics of the unfortunate Jeannette to have traversed the intervening distance in the space of three years, even if it were possible at all. There remains only the alternative that there is a comparatively short and direct route across the Arctic Ocean by way of the North Pole, and that nature herself has supplied a means of communication, however uncertain, across it. Increased significance to the discovery of the Jeannette relics in 1884 was given by the identification in 1886 of bows found on the coast of Greenland with those of the Eskimo in the vicinity of Behring Straits, at Port Clarence, Norton Sound, and the mouth of the Yukon river. M. Nansen's expedition will endeavor to realize these hopes of a direct route across the apex of the Arctic Ocean. A specially constructed boat of 170 tons will be built, and provisions and fuel taken for five years, although it is hoped that two will suffice. The expedition will consist of ten or twelve men.

THE REAL FAITH CURE.

The subjoined definition of "Faith Cure" we find in an exchange attributed to Dr. Lyman Abbott of Brooklyn: "When I get sick I will show my faith in God by securing the best doctor I can find, getting the best human skill, and following the directions given me by a good physician. Faith does not consist in refusing to take medicine, but it is the using of all the means of cure which is given us to use, and medicine has been shown to be one of those means."

AN EXPENSIVE SERVICE.

The State of New York indulges in an expensive luxury of questionable utility. It is entitled the State Dairy Commissioner, with the usual adjuncts of several deputies, a messenger, janitor and bottle-washer. As the several Boards of Health throughout the State practically do all the work that this functionary is popularly supposed to do, there is nothing left for him but to strut around and pose in the newspapers as the ever-vigilant and constantly protective Cerberus of our milk, butter and cheese. His functions are naturally supposed to to be in the interest of our farmers—indeed, if he does anything at all, it must be for them, he never having been known in any way to interfere with the rascalities practised by the honest farmer on an unsophisticated and suffering city public. One thing he does attend to with great care and perseverance—he keeps himself and his office well before the public. At every opportunity he appears in print, and to read the sensational nonsense emanating from his office one who does not know his ways is led to think that if it were not for our omnipresent Dairy Commissioner we would all be poisoned. First the onslaught was made on oleomargarine manufacturers, until by dint of persecution he drove every decent man out of the business and left the field as a monopoly to the sellers of the vilest mixtures of so-called dairy butter. It is true that he was defeated in every case ever brought in the higher courts, but having the public treasury at his back, he could carry on his lawsuits until business men found that it was cheaper to give up than to contend. The result has been that the poor man is to-day compelled to pay exorbitant prices for nauseous compounds of dairy refuse, because the Dairy Commissioner has driven all clean and wholesome butter substitutes out of the market, and the rascally butter dealer in the country can sell anything that is the product of the cow, but deteriorated by decomposition and dirt until actually unfit to eat. The Dairy Commissioner can only see oleomargarine as the one butter to butt against. Cheese is just as vile, and only when compelled by the rigid inspection of the exchanges for commercial reasons does the cheese-maker furnish anything like a good article. Better American cheese can be bought in Europe than in New York, simply because the maker is compelled to furnish a good article for export. For none of these articles of dairy product, if good, is the public in any way indebted to our Dairy Commissioner. Now we hear from that ornamental functionary again through a highly sensational article in the daily press on the subject of unwholesome milk preservatives. He alleges now that this sudden outbreak is due to the high price of ice. Every one knows that these milk preservatives have been used in New York milk for years, that they have been publicly advertised in the dairy papers, and the Dairy Commissioner has known of their use by farmers for years. The trouble is that he labors under the delusion that his office was not created to protect the public against the farmer, but to coddle the farmer. This time he has

caught milk dealers using these preservatives, and a loud, pompous announcement of the great things the Dairy Commissioner will do sounds well, and paves the way for another big appropriation next winter. Had he looked in the columns of the AMERICAN ANALYST for several years back he might have saved himself the excitement of discovering this mare's nest. The foolish excuse given by his chemists that these adulterations are difficult to discover, because the preservatives are frequently changed, is ridiculous. The Dairy Commissioner's spasmodic bubbles are easily pricked.

IN THE DEPTHS.

INTERESTING NARRATIVE OF A SUBMARINE DIVER'S EXPERIENCES.

After a sea-going experience of fifteen years, during which I have often had cause to feel that I was face to face with death, I cannot remember ever having betrayed more deliberate symptoms of fear than I did when about to make my first descent under water in the suit of a submarine diver. A celebrated philosopher and poet has said that "as the memory relieves the mind in her vacant moments, and fills up the chasms of thought with ideas of what is past, we have other faculties that agitate and employ her upon what is to come." That "what is to come" precisely describes fear, and as I stood on the rungs of a diving launch's ladder, encased in a waterproof suit fully two sizes too large for me, with breastplate and helmet firmly screwed down, and shoes on my feet weighing twenty pounds each, I am convinced I had a full cargo of it. A necklace of lead weighing eighty pounds having been adjusted around my shoulders, and my manila life-line having been hauled taut around my waist and stopped with the air-hose to the side of my helmet, my instructor gave the signal to his assistant to start the pump, questioned me with regard to my signals, cautioned me not to "make a d——d fool of myself," as many others had done, and then screwed on the face-plate, which cut me off from all ordinary communication with the world. What emotions welled within me as I descended step by step, I shall not trespass on space to describe; suffice it to say it was almost a hundred to one against my descending at all, I felt so dreadfully afraid. Pride and will finally conquered, however. I compelled my almost paralyzed limbs to perform their office, the last rung of the ladder was reached, I grasped my guide rope and slowly let myself down to the bottom. During my descent I had experienced a most frightful ringing in my ears; it seemed as if the drums were about to burst. On my reaching the bottom I remembered the injunction of my instructor to "swallow my breath, yell or sing," I practised all three, with the result that I was instantly relieved. I then set about a tour. The fish, of which there were a great number, swam around me, peered curiously into the glass plate of my helmet for a few moments, then, as if satisfied, swam away again. I put out my hands, as if to catch them, but this did not seem to scare them in the least; on the contrary, they clustered around me all the more closely. They appeared much larger than the same species which I had seen out of water. After a while, the bottom being very muddy, and being unable to see perfectly, my feet slipped from under me, and I made what I thought was a Brooklyn Bridge leap. After regaining my footing and receiving one tug on my life line, which was a signal inquiring whether I was all right, I explored this apparent chasm, and found it was only about six feet deep. I suppose I remained under water fully half an hour on my first essay. I did not ask to be hauled up, but waited until the signal "come up" was given me. During my stay under water I had made the acquaintance of more live eels than ever before in my life, although I had only descended to a depth of thirty feet. I felt none the worse for my descent on my arrival on top, and began to think I had within me the making of a model diver. My second essay was not so successful. It was in deeper water—probably twelve or fourteen fathoms. I started out to find a cable that was somewhere near where I had been let down. I scrambled around for some time without any success, when, my right shoe having become entangled in something on the bottom, I had the misfortune to lose it. Finding it impossible to keep my right leg on the bottom, because of its decided tendency to practise high-kicking every time I moved, I signalled "pull me up." When my faceplate was unscrewed I explained that I had lost one of my shoes. My shoe having been replaced, in a few minutes I was descending again, this time to hunt up my lost one. After a search of probably a quarter of an hour, I espied it half jammed under a large stone. Unfortunately for myself, in my eagerness to grasp it, I bent forward from a standing position, instead of dropping on my knees. The consequence was that the air in the upper part of my suit escaped to the legs and lifted my feet. I tried and tried again to regain my footing, but could not, and eventually had to go up feet first. My second essay was not without fruit, however. I had regained my lost shoe and had learned a very valuable lesson. Since then I have worked under ship's bottoms, on stages weighted with kedge anchors and placed in position by myself, and have rarely experienced any difficulty in performing the work which I set out to accomplish. When a man once becomes accustomed to working under water, he can handle tools with almost the same precision as he does upon dry land. In shallow water—say from six to eight fathoms—it is difficult to keep one's footing, because the pressure of the water is not sufficient altogether to overcome the air in the suit. A man can easily work for three hours in ten fathoms of water, but in twenty an hour is considered very good work. It takes a strongly constituted man and a good diver to work at all in thirty fathoms. All this talk of men descending to fifty fathoms I believe to be utter "rot." I have conversed with some of the most expert divers from time to time, and the consensus of opinion seems to be that a man who can stay in thirty-four fathoms for half an hour is a good one. In submarine diving one soon discovers that in order to descend to any great depth and remain a length of time it is desirable to let one's self down slowly. Going down quickly starts a rush of blood to the head, and in almost all cases the diver will find himself bleeding from the eyes, nose, mouth and ears, and suffering intense pain on his touching the bottom. Given a light, sandy bottom and clear water, a man can discern objects at a great distance; but if the bottom is at all muddy it is almost equivalent to one's groping his way in a thick fog. The average weight of the submarine diver's suit and its equipment is about 150 pounds, so that when a man weighing, say 130 pounds—and men of that weight generally make the best divers if perfectly sound—descends below the blue depths he is carrying on his body twenty pounds more than his own weight; yet on his touching the bottom he feels so light that he could run a race if freed from his air-hose and life-line. The signals in use in submarine diving are as follows: One tug on the line signifies "All right;" three, "Haul me up." One tug on the hose means "More air;" two, "Less air." In case the life-line gets jammed or fouled by any means and the hose is clear, three tugs on the hose signifies "Haul me up." If the two are jammed then it becomes necessary to send a second diver down to clear the first. While on the subject perhaps it would be worth while to relate a few incidents which have come under my notice while attending other men. By the way, it takes three men to attend a diver—one to dress him and attend to his signals while below, and two to pump air.

One very dark night about three years ago a diver descended under the boathouse at the Torpedo Station, Newport, R. I., for the purpose of testing a 100-candle-power incandescent submarine lamp. He had scarcely been under water five minutes when, owing to the imperfect insulation of the wires, he became "short-circuited" and was knocked flat on his back. His attendant, scarcely more fortunate, received the current along the wet line and hose, and for a few minutes he thought spring had come. It needed only a few moments to cut off the circuit, haul up the diver and unscrew his face-plate. Strange to relate, he said he felt "all right," having only been stunned for a few minutes. He was able to tell us that, by the aid of the light, he could see perfectly within a radius of fourteen to fifteen feet. On another occasion we had the misfortune to lose the anchor of a submarine mine in Newport Harbor. The senior member of the diving class, a youth of some thirty-five summers, as conceited of his imaginary prowess as ever Beau Brummell was of his foppish actions, volunteered to go down and hunt it up. He was speedily rigged and we proceeded to pay out line and hose in order to give him plenty of room in which to swoop around. After he had danced a minuet under water for about half an hour—it seemed like it anyhow from the gyrations and peculiar movements of his air bubbles—we got one tug. We started to haul, but not an inch did our diver budge. We tugged and tugged in vain for about five minutes, until at last we came to the conclusion that he had fouled himself, and that it would be advisable to send down another man to clear him. With this object in view another man was hastily dressed and was just about to descend when the hose began to tighten in our hands and up comes our hero himself. He had got tired of waiting for us to haul up, he said, so he thought he would haul himself up. It never for an instant occurred to the genius that he ought to be placed in the category of the obtuse mortals who are incapable of attending to simple instructions for the preservation of their lives. This fellow had deliberately unloosened his life-line—his most important means of communication with his attendant—and fastened it to a 500-pound anchor and signalled "haul up." The mere fact of his unbending his life-line proved that he did not realize his danger. By doing so he left himself open to the most horrid of deaths had the hose proved to be of poor material. It is needless to add that this performance was his last at the Torpedo Station.

PHENOL SODIQUE.—Dr. Adolph Tscheppe, in the *Pharmaceutische Rundschau*, publishes the following caustic *exposé* of phenol sodique, a proprietary article which has been assiduously puffed as the great antiseptic fluid: Phenol sodique is the synonym given to the solution of sodium carbonate of the National Formulary. The preparation, however, says Geo. M. Berringer (Phil. Coll. Pharm. Proceedings), is not at all similar to the well-known proprietary article sold by that name. A sample of the latter, prepared in Philadelphia, showed the following characteristics: A thin, dark-colored, almost black liquid, sp. gr. 1.015, an alkaline reaction.

It contains 66 per cent. of tarry matters and about 1 per cent. of phenols, which are not separated in diluting with water, and nearly 1.5 per cent. of soda. The following formula yielded a preparation very similar to it: Take of

Coal tar	tr. oz. 2
Soda, caustic	gr. 120
Water, enough to make	fl. oz. 16

Dissolve the soda in four fluid ounces of warm water, add the coal tar, and thoroughly agitate for a few minutes. Then add the remainder of the water and set aside in a covered vessel in a warm place, frequently agitating for seven days. Decant and filter.

From this it would seem that the much-vaunted phenol sodique is a very cheap solution of coal tar in caustic soda sold at a high price.

GERMAN WINES.

THE ORIGIN OF SOME OF THE FAMOUS RHINE WINE BRANDS.

Under the general designation, "Rhine wines" we understand the various growths beginning from the valley of the Ahr up to Johannisberg. The Moselle wines are also included under this heading, although they have no characteristic in common with Rhine wines proper, and in quality are actually inferior. The usual classification adopted is (1) Moselle growths; (2) growths of the right bank of the Rhine; (3) growths of the left bank. Among the Moselle wines the most prized brands are Brauneberg, Thiergarten, Neuberg, Josephshof and Oligsberg on the Upper Moselle; Winningen on the Lower Moselle; Scharzberg in the Saar valley; and Erden Bernkastel, Wintrich, Braunberg, Graach, Wehlen and Pisport on the Middle Moselle. Belgium buys fairly large quantities of these wines, which are light and attractive. Turning to the left bank of the Rhine, the growths of the Ahr Valley, between Bonn and Coblentz, are very celebrated. They are white, dry, of good alcoholic strength, and fragrant; but, according to the *Revue Vinicole*, they require from seven to eight years' keeping to lose their slightly harsh flavor. With increasing age, they attain, like the Rhine wines in general, a surprising excellence. In good years the production of the Ahr valley reaches a total of three and one half million bottles, The valley of the Nahe, south of the Moselle, boasts 2,078 hectares of vineyards, and has given birth to the growths of Montzingen, Kreuznach, Bretzenheim, Steeg. One of the most favorite wines of the left bank, Liebfraumilch, is grown near Worms. Konigsbach, near Neustadt, produces fairly good red wines, and most excellent white wines. Around Mayence grow Niersteiner, Oppenheimer and the renowned Rudesheimer. The culture of the grape is said to have been introduced there by Charlemagne, who transplanted vines from Burgundy. All wines from the left bank have less body than those from the right bank, but they are of greater delicacy and more aroma. All wines of the right bank have much strength, flavor and bouquet, but they are a trifle acid, and only gain their valued qualities after prelonged keeping. Of these growths the first and favorite marks —viz.: Hochheimer, Eltville, Wollrath, and the famous Johannisberger, are all raised between Mayence and Coblentz. These vineyards were formerly the property of the convents and chapters of the Catholic Church. It was an Abbot of the Convent Fulda, who, in the year 1716, erected the Castle of Johannisberg, which now belongs to the Metternichs. Their property now extends to sixty-three acres, and their brands are the most in request of all the prominent Rhine wine varieties. But the Metternichs are not the only growers of Rhine wines; the Duke of Nassau is proprietor of Steinberg, and a third of the Steinwein estate belongs to the King of Bavaria. The royal cellars of Bavaria are accounted the finest in Germany, and even in the world. According to the *Standard*, a cellar of exquisite wines collected for centuries by the Bavarian sovereigns, and by reason of their choice qualities esteemed unique, was sold by order of Louis II. at an enormous price to rich English gourmands. During the last years of his life this ruler exhibited an absolute horror of old wines, and drank consequently only new wine. The wines stored in the royal cellars at Wurzburg were the object of the most careful and ceremonious handling. Precise instructions were laid down as to origin, age, treatment and bottling. It was an inviolable principle never to allow wines on the royal table till they have reached their highest degree of perfection. The pearl of the collection was a Steinwein of 1640, which, according to our authorities, had retained its brightness, its beautiful golden color, and something of its old bouquet. Among other choice wines which reposed in this cellar may be mentioned Steinwein of 1640 and 1731, Johannisberg of 1811, Rudesheimer and Hochheimer of 1832, Moselle wines and Rhine wines of every vintage, and especially of 1861, Malmsey of 1834, and lastly the royal Tokay, which the Austrian Emperor presented to the King of Bavaria. The wine trade of Germany becomes every year of greater importance. In Hamburg, especially, figures have been reached far in excess of anything before known. According to the last official statistics, the imports into Hamburg amounted to 307,507 hectolitres, of the value of 24,274,240 marks. France is the largest contributor, and her trade, like Portugal, shows a marked increase. The greater part of the Hamburg imports are destined for subsequent exportation. The largest customers are especially the United States of North America, then Argentine, Uruguay, Chili, Brazil, where the consumption of wine is continually rising. As regards the importation of German wines into European countries, Great Britain deserves first mention, then Denmark and Scandinavia.

FOAM AMD FILMS.

HOW OIL SMOOTHS THE TROUBLED WAVES.

In a lecture on "Foam," Lord Rayleigh insisted that foaming liquids were essentially impure, for pure liquids will not foam. For instance: neither water nor alcohol can be raised into a froth, although a mixture of the two may be to a certain extent. The addition of gelatine to water in the proportion of 1 in 100,000 develops the foaming quality quite noticeably. Of course the best known foaming liquid is a solution of soap, such as the children use for blowing bubbles. A liquid foams when its films have a certain durability. In all liquids these films exist, since a bubble as it rises is covered with a thin film. Now, the most striking property of films is their tendency to contract, and they may be regarded as being in the condition of a stretched membrane, as of India-rubber, with the difference that the tendency to contract never ceases. An air bubble will force the air back through the pipe, and a loop of silk floating on a film will be forced into a circle the moment the film inside is ruptured. Oil forms a film on the surface of water, and covers it entirely, even if the mass of the oil be collected into drops. This is well shown by dropping a particle of oil on to a vessel of water lightly covered with sulphur flour. The sulphur will be immediately driven to the edge by the spreading film. The reason of this is that the tension of the water-air film is greater than the combined tensions of the water-oil and oil-air films, and consequently pulls out the oil film. It is possible to reduce the surface tension of water by mixing it with various substances, such as ether and camphor. Camphor scrapings placed on the surface of pure water enter into vigorous movements, because the dissolved camphor diminishes the surface tension of the water; but if the water be contaminated by the least quantity of oil or grease, the motion ceases. Lord Rayleigh made several experiments to find what thickness of oil film would accomplish this; he found it to be about 1½-millionth of a millimetre. This thickness bears to an inch the same ratio that a second of time bears to half a year. Lord Rayleigh explains the calming action of oil on the sea as follows: As the waves advance, the surface has to submit to periodic extensions and contractions. At the crest of a wave the surface is compressed, while at the trough it is extended. So long as the water is pure there is no force to oppose this; but if the surface be contaminated, the contamination strongly resists the alternate stretching and contraction. It tends always on the contrary, to spread itself uniformly, and the result is that the water refuses to lend itself to the motion which is required of it. The film of oil may be compared to an inextensible membrane floating on the surface of the water, and hampering its motion.

STAKING A SHINER.

MR. ARMOUR THE BOOTBLACK'S PROTECTOR.

The subjoined readable anecdote relating to Phil. Armour, of Chicago, we republish from the *Butchers' Advocate* of August 6th, a paper which for many months has displayed a special fondness for everything relating to Mr. Armour's personality.

A bootblack walked into the office of Mr. Armour. He had none of his outfit with him, but the bootblack was stamped in his face and all over him. He went to the gate where a guard stands between his post and the greatest packer in the world. "W'ere's de old man?" asked the urchin. The guard told the boy to get out. "You tell the ole man that I want to see him. I want to see him alone I don't want to bodder you, nor de ole man, but I want to see de ole man an' I want to see him right off." Mr. Armour at his desk overheard the ragged request. "Let that boy come in here," he called to the young man at the gate. The urchin approached Mr. Armour in a business like way. There were no preliminary compliments. "Say," spoke the urchin, "I took a nap out dere in de alley, and w'ile I was asleep some o' dem kids from the board o' trade come along and swiped (stole) my kit an' I'm short. I want ter borrar a dollar to buy me a kit an' I'll pay you back on de 'stallment plan. See?" Mr. Armour handed the boy two silver dollars and told him to go, but the boy handed back one of the dollars and said: "I doan' want but one. I'm goin' to pay it back, and dere's no use o' a man goin' ni deeper'n his head. I allus keep my head above the water. The truth of the above story is vouched for by one who saw the scene and overheard the conversation.

TRADE-MARKS.—Trade-marks were known in ancient Babylon. China had them as early as 1,000 B. C. They were authorized by Parliament in England as early as 1300.

EDUCATED RELIC.—The longest-graduated college alumnus in this country is Rev. Dr. Herman Halsey, of East Wilson, Niagara County, New York. He was graduated from Williams in 1811, and is ninety-seven years old.

MAKING HISTORY.—Miss Alice B. Sanger is the first woman ever employed as a clerk in the White House. She is an expert stenographer and type-writer. She is about twenty-two or twenty-three years old, and a blonde. She writes all the President's personal letters, and is secure in his confidence, having been his stenographer for over two years.

BRICK FOR BUILDERS.—Brick is the material which has now been almost universally adopted by the big builders of this city. All of the recent great business buildings including the enormous Mills, Morse, Kelly and Schemerhorn structures are almost entirely of brick. Iron fronts warp, and both marble and granite crack in an alarming fashion in the presence of great heat. The durability of brick has been proved in all the recent down-town fires, and it is regarded as the only material that is wholly fireproof.

CARBON.

ONE OF THE MOST ABUNDANT AND VALUABLE PRODUCTIONS OF NATURE.

In looking over Mendelejeff's table we find at the head of the fourth series the element carbon. It is one of the most abundant elements, and one of the most important in nature. It is the characteristic element of organic chemistry, where it forms a sort of framework upon which the organic compounds are grouped. Indeed, inorganic chemistry is called by some the study of the carbon compounds. Carbon occurs in all vegetables and in some minerals. It also exists in three allotropic forms, as the diamond, graphite, and charcoal. The diamond is the purest form of carbon, occurring in nature usually in the conglomerate formations. India, Brazil and the Cape of Good Hope furnish most of the diamonds in use, the Cape of Good Hope mines being more recently discovered. The diamond has probably never been made artificially, although many attempts have been made. In order to make one the carbon would have to be liquefied and crystallized. But carbon is only soluble in melted cast iron, and is infusible; and so diamonds could not be got in this way. Making diamonds from benzole was at one time tried by a Scotch chemist, but with questionable success. In nature they are probably made from some liquid form of carbon, but little or nothing is known of the process. Although they may be of almost any color, they are usually white, and when entirely free from all color are said to be of the first water, and these are the most valued. However, owing to impurities, they may be gray, yellow, brown, green, red, blue, or black. The rose diamonds are valued highly, and next to them the green. To heighten the effect of a diamond, it must be cut. This is a very slow and tiresome job, sometimes taking many weeks or months to finish. The stone is first clipped off, piece by piece, until it is nearly the required size. It is then fixed upon a steel spring, by means of melted lead, and the lead allowed to solidify. This spring is then pressed down until the stone reaches a swiftly revolving steel wheel, upon which there is a quantity of diamond dust, called "bort," By the constant grinding of the stone against the bort, a smooth plane or face is formed. And this is what is meant by diamond cutting. The operation must be repeated for each face. The commonest forms after cutting are the rose and brilliant. The diamond is the hardest substance known, but is quite brittle. Besides its extensive use as a gem, it is used for cutting glass and in making diamond drills for boring rock. Quartz is hard enough to scratch glass, but the diamond point is more curved than that of quartz, by virtue of which it gives a cleaner scratch, and so is always used. Diamonds do not occur to any extent in the United States, although small ones have been found in North Carolina. The second allotropic form of carbon is graphite, sometimes—but wrongly—called blacklead. It is found principally in Siberia, Cumberland, and at Ticonderoga, where it occurs as lumps between layers of slate. It is of a grayish-black color, soft, greasy, and has a metallic lustre. It can be made artificially by dissolving carbon in melted cast iron and treating the product with dilute hydrochloric or nitric acid to remove the iron. Owing to its high fusibility, it is used for making crucibles for melting substances which require great heat. It is also used with oil as a lubricator, also in electrotyping. Its most important use is in making pencils. The graphite is crushed fine under water, on top of which it floats off through a series of tubs, each a little lower than the one before, and in this way the fine powder is separated from the coarser. Pipe-clay is then added to it, and enough water to make a paste about as thick as cream, and this is ground until the substances are perfectly mixed. For hard pencils, more clay is added; for soft ones, less. Medium hard pencils contain about seven parts of clay to ten of graphite. After grinding, the paste is put into canvas bags and pressed until all the water runs out, leaving a thick dough. This dough is then put into an iron cylinder with a tight-fitting piston. In the bottom of the cylinder are holes of the size and shape of the lead desired, and through these the dough is slowly forced by the descending piston, coming out in long strips. These strips are then cut into the proper lengths, baked, and put into their wooden cases. The third or amorphous form is represented by charcoal. Charcoal is made by burning wood in a limited supply of air. Sticks of wood are piled up into a round heap, with a small hole in the centre for a chimney. Another hole runs from the chimney to the outside of the pile, so as to give a draught. The whole pile is then covered with sod and earth. The wood is lighted through the chimney, and chars slowly until it is all converted to charcoal. The time required varies from one to three weeks, according to the size of the pile. The best quality of charcoal is made by heating wood in iron cylinders. When made in this way, some other valuable substances—such as wood alcohol, etc.—are also formed, which run off as liquids and are collected. This kind of charcoal is used for gunpowder, Charcoal is black, lustreless, soft and smutty. It has no crystalline form, but retains the internal and external forms of the tree from which it is made. While the wood in the pits is charring, the walls of the wood cells become charcoal, but the matter within the cells is driven off. This makes the charcoal very porous, and it absorbs air to such an extent as to float on water. Charcoal has a strong tendency to condense gases on its surface. It acts on different gases to different degrees, but most readily on ammonia and sulphuretted hydrogen. It is also used to absorb coloring matter in bleaching colored solutions; but boneblack—a sort of charcoal made by burning animal bones—is better for this purpose. Brown sugar is turned into white sugar by running it through a layer of boneblack from twenty to thirty feet high. Lampblack is made in much the same way as charcoal, only no wood is used. Heavy oil of tar or natural gas is burned in a close chamber, at the top of which is a tight-fitting iron dome. The oil is lighted and burns with a smoky flame, giving off small particles of carbon, which are condensed on the sides of the chamber into lampblack. When the process is finished the dome descends and scrapes the lampblack off. It is tolerably pure, is very black and permanent, and can be advantageously used in making paint, blacking, etc. The question may sometimes arise: How do we know that these allotropic forms are really carbon? The proof is, if we burn twelve parts or carbon it will give forty-four parts of carbonic acid gas—and this is the case with each of the three forms.—*Pop. Sci. News.*

BEWILDERING BEER.

THE ALLEGED INGREDIENTS OF A GLASS OF LAGER.

A writer in a German newspaper has had the temerity to jot down the ingredients which go to make up a glass of beer in Germany. The pharmacopœia of the beer barrel this scientific man sets forth in alphabetical order. We give the German nomenclature for fear of spoiling the brew. It consists, says the writer, of alcohol, althopfenol, aloe, belladona; biercouleur, bilsenkraut, bitterklee, buchenspane, caraghenmoos, coloquinten, enzian, fichtennadelh, gogel, gelatine, glycerine, hazelnuszspane, hausenblase, herbstzeitlose, hopfenaroma, hopfenbittersaure, Ignatiusbohne, ingwer, kamille, kartoffelzucker, kardobenedictenkraut, kokelskorner, koriander, lakritzensaft, laugensaltze, malzetract, metallsalze, mohn, moussripulver, natron, nieszwurz, nux vomica, (brechnusz), pikrinsaure, pottasche, quassia, reis, salicylsaure, schafgarbe, Spainscher, pfeffer, soda, starkezcuker, starkemehl, strychin, syrup, tannin, tausendguldenkraut, tischlerleim, wachholder, waldmeister, weidenschalen, wermuth, zuckercouleour, &c. This is why we *pass* on lager.

LIGHTNING.

THE VARIOUS MANIFESTATIONS OF THE LIGHTNING FLASH.

1. As to the term "forked lightning," the representations of it given by artists, which resemble the so-called thunderbolts placed in the hand of Jupiter, are quite absurd. The flash, when photographed, exhibits itself as a line which is continually changing its course, and is described as "intensely crooked" by a very careful observer. It never proceeds for a time in a straight line, and then, turning at a sharp angle, going on further in an equally straight line, as is represented in pictures. The forking of it is very marked, and this occurs by side flashes passing off from the main track, and eventually losing themselves, like the ramifications of tree roots. Occasionally the lightning appears to start from a point from which several flashes diverge in different directions.

2. "Sheet Lightning."—Whenever a flash passes from a cloud to earth, the light produced by it illuminates the sky in the neighborhood, and the more intense the flash the more brilliant and extensive the illumination. At times, sheet lightning has been proved to emanate from an ordinary storm distant more than a hundred miles from the point of observation. It is, however, maintained, and apparently with good reason, that occasionally lightning of the "sheet" type, such as what is called "summer lightning," takes place, without any thunder; so that, in such cases, no actual thunder storm is in progress.

3. "Globular Lightning."—This is a rare phenomenon and one which no one has, as yet, been able to produce in the laboratory, whereas the phenomena of the two previous types are easily produced. The general description of the occurrence is that a luminous ball is seen moving very slowly, not touching any object and eventually breaking up with a violent explosion and the appearance of several flashes of ordinary lightning. It is reported that persons have gone out from a house into a street to follow such a ball and watch its movements, so that the occurrence must have lasted at least a couple of seconds. Ordinary lightning, as is well known, is practically quite instantaneous. The size of the ball on different occasions has varied from that of an orange to that of a large glass lamp globe, or even larger. Many physicists refuse to believe any accounts of this manifestation of the electrical discharge, but the reports of it are too numerous and circumstantial for us to consider them to be entirely baseless.

WOMEN'S WORK.

A WORD IN FAVOR OF HER EMPLOYMENT IN THE DRUG STORE.

To put it squarely, we ask the question why will not woman make a good druggist? She has quickness of discernment, is skillful in the use of her fingers, and light in movement. These are important qualities to the analyst and compounder. In the many details of domestic service, especially in the kitchen, they come into play just as much as they do in the laboratory of the pharmacist. In fact, one who would be competent as a cook for a large family would, we think, be competent as a druggist. It is suggested that a girl of the necessary intelligence and education is not willing to pass through the ordeal of preparation that every boy does who aims to be a dispensing pharmacist. She does not incline to the bottle washing, case polishing, and lamp cleaning features of the shop, but wants to be graduated at once into the higher branches of the profession. Perhaps this is the case with many girls; it is also, we know, the case with some falsely ambitious young men, but we are sure that the young woman who is in earnest would be willing to work her way up the coarse steps

of the business, knowing that such experience if useful. But there are some drug stores managed by women, and successfully. This fact we know, and it settles the question of their competency for a line of usefulness that is likely to last for many years longer. The common method of drug prescribing for illness may gradually decline, but the use of chemicals for sanitary purposes, anodynes, washes, lotions for local application, mineral spring waters, toilette articles, surgical appliances, bath conveniences, and a thousand other things, will always be needed in civilized society and make the pharmacy a permanent fracture. We should advise the bright young woman who would be up and doing for herself, and who feels deterred from trying this or that because there are so many of her sex in it already, to try pharmacy. The good drug clerk is not "a *drug* in the market," but there are places always open, judging by the advertisements in every day's newspapers, for the industrious and capable woman as well as for the competent man.—*Phrenological Journal.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

August.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal, venison.

FRUITS.—Cherries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple, grapes, plums.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, crabs, clams, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, salmon, turtle, trout, sturgeon, whiting, weak-fish, rockfish.

VEGETABLES.—Beans, beets, cucumbers, cabbage, carrots, cauliflower, corn, egg-plant, lettuce, onions, parsley, parsnips, potatoes, squash, shallots, spinach, turnips, radish, rhubarb, tomatoes.

PRACTICAL RECIPES.

VEAL CAKES.—Mince the remains of cold veal very fine, add to it some fine sweet herbs, a little grated lemon rind, pepper and salt; form into little cakes and fry in boiling lard or drippings.

MARMALADE PUDDING.—Make a paste as follows: Three-quarters of a pound of flour, six ounces of suet, salt and ice water sufficient to make a soft dough; roll out quite thin, spread with orange marmalade, roll up, moisten the edges of the paste with egg and press together. Tie up in a pudding cloth and boil for an hour and a half.

SNOW EGGS.—Put a scant half pint of milk to boil in a shallow saucepan, with a little sugar; whip up the white of an egg to a froth, and when the milk boils drop it by tablespoonfuls on top of the milk; turn it after a moment, and when solid lift it out; mix the yolk of the egg with sugar, add a little boiling milk, pour it into the rest of the boiling milk, boil for a few moments; pour around the whites and serve.

STEWED KIDNEYS, WITH MUSHROOMS.—Bleach one-half dozen mutton kidneys, slice them very thin, put them over the fire with just enough water to cover them, a piece of butter the size of a walnut, salt and cayenne pepper; cut three thin slices of bacon in little bits, and stew with the kidneys; when they are nearly done, cut fine half a can of mushrooms; when done, thicken the gravy with a tablespoonful of flour, rubbed smooth with milk; boil up and serve.

PICKLED NASTURTIUMS.—Gather the little knobs as soon as the blossoms are off and let them lie in salted water three days, stirring them up every day. Make a cold pickle of white wine vinegar, eschalot, pepper, cloves, mace, nutmeg cut in large pieces, and horseradish; put the nasturtiums in this.

CHICKEN PANADA.—Rub in a mortar a cupful and a half of meat from the breast of a fowl, with a cupful and a half of stale bread crumbs; add gradually sufficient of the water in which the chicken was boiled, or other broth, to make it very wet; boil for a few moments and rub through a sieve.

ESCALOPED WHITEFISH.—Boil a whitefish weighing about one and a half pounds; put on cold, with one-quarter cup vinegar in it and two tablespoonfuls of salt. When it is so well done that the fish leaves the bones, drain it, and set away to cool. Make a sauce of one pint of cream, an onion cut in half, pepper and salt, and flour enough to make it quite thick; remove the onion, when done, and take the sauce from the fire; pick the fish from the bones and arrange it in a baking dish, with alternate layers of the sauce; sprinkle cracker crumbs over the top, and bake a golden brown.

DEATH FROM AMMONIA.

HOW TO DETECT ITS PRESENCE IN BAKING POWDERS.

The New York *Tribune* chronicles the death, after terrible suffering, of a Russian painter from having accidentally swallowed some ammonia in a glass, through a mistake of a druggist. This accident conclusively shows that while diluted ammonia may be used with good effect in cleaning windows and silver, it is totally unfit for and dangerous when introduced into the stomach. We feel, therefore, compelled to call our readers' attention to the fact that they should always fight shy of using any article of food containing ammonia. In view of the fact that many baking powders—some high-priced ones—contain this drug, ammonia, every housekeeper should test the baking powder she is using. A few minutes will settle the important question of the purity of her baking powder. Housekeepers' Test for Ammonia in Baking Powders: Mix one spoonful of the suspected baking powder with one spoonful of water in a tin cup; boil it a minute, stirring to prevent its burning, and if ammonia is present you can smell it in the rising steam.

STOLEN TROPHIES.

THE PURLOINED DECORATIONS OF VENICE.

Venice is a vast museum of stolen property. A self-righteous inscription over the gateway of St. Mark's informs the visitor, with much show of conscious probity, that the four famous antique bronze horses above the portal, "removed by the rapacity of the enemy to Paris" under Napoleon I., were again restored to their proper place by that incorruptible champion of strict international morality, the Emperor Francis. But the glorious team, a work of the sculptors of the Neronian age, had previously been stolen in the thirteenth century by the Doge Dandolo from Constantinople, whither they had been carried from Rome, for his own glorification, by Constantine the Great, who had filched them himself from the triumphal arch of Trajan, who in turn had borrowed them, as seems probable, from the similar monument of his predecessor Nero. Such are the humors of the world and the whirligigs of time. Indeed, if every man had his own again, one might almost say there would be no Venice. The column of St. Mark's, with its winged lion, would go back to Syria; the square pillars by the Doge's palace would return once more to St. Saba, at Ptolemais; the alabaster supports of the inner canopy would find their way back, men say, to Solomon's Temple; and even the moldering body of the Evangelist itself, which reposes beneath its pall of gold and jewels below the high altar, would have to migrate to the community from which it was first filched, the Coptic Christians of Alexandria.

LEAD IN LACE.

A CAUTION TO THE FAIR OWNERS OF FINE GOWNS.

Ph. De Clarmont gives an account, in *Le Moniteur de la Teinture*, of a white satin dress totally ruined by its trimming with English lace. The dress had been worn but once, had then been packed into a trunk which was deposited in a damp place and exposed to emanations of hydrosulphuric acid from gas. When taken out it was found that the pattern of the lace, particularly of its tulle ground, had been printed in indelible black upon the white satin. The accident was not difficult to explain. English lace is habitually charged with sulphate of lead, which in this case had absorbed hydrogen and hydrosulphuric acid from the atmosphere, forming sulphide of lead, which had been imprinted and fixed upon the white satin, which naturally had also absorbed hydrogen and hydrosulphuric acid. The seller of the lace showed that charging English lace with white lead sulphate of lead) was commercial usage, and thereby escaped paying the damage. An objectionable usage it is at any rate, as the absorption of lead through the skin from such lace may become dangerous to health.

CALIFORNIA WINES.

Mr. C. F. Oldham, of the old firm of Grierson, Oldham & Co., of London, one of the largest wine importing houses in England, was interviewed by a reporter in San Francisco shortly before his departure for home. He said: "Being interviewed is a comparatively new experience to me. We have none of it in England, and now that I am about to return to my own country I am free to speak frankly of what I have seen in the wine-producing districts of this State. Whatever I say is with the idea constantly before me that I am considering what will please the English palate. Americans not being wine drinkers are, I should judge, more easily pleased than people who use wine habitually. Considering first your champagnes, I must confess that I came to California full of prejudice against the idea that champagne could not be made outside of France, and now that I am about to go to my own country I am equally free to say that this prejudice has been wholly removed. There is really but one champagne producer in California, Mr. Arpad Haraszthy. I am surprised at the excellence of the article which Mr. Haraszthy has shown me, and I shall take samples of his Brut to England to show to experts as samples of what can be done in California. The English people like their champagne drier than most Americans; for, while we drink the foreign Brut almost exclusively, Americans incline to the Sec, or even sweeter kinds. Turning to your clarets, I find some that are first class, some only fair, and some that are very poor. The 1889 wines, as a rule, are best suited for the English market, because, with proper handling, they will develop splendidly. Of course, they are not fit to be placed on the market now, however. Your clarets are all full-bodied—and the English like a wine with a good body—which is further in their favor. There is a very general tendency to run to acidity, which is to be avoided. I see no reason why an exceedingly lucrative market for properly-handled California clarets should not be found. The situation is one full of promise. As far as the white wines are concerned, I must say that they are still better than the reds. I found some magnificent white wines in this State—some as good if not better than the famous French white wines or the Rhine wines. Some of them are truly grand. In every case where I found the best

I discovered that only the finest grapes had been used in their manufacture. You have a splendid future for this sort of wine in the English market, and there is no reason why with the best judges, and consequently with the best class of consumers, they will not be appreciated as well as the vintages of Germany and France. Your sherries are not at all suited to the foreign taste, and the fortified wines generally are not what is wanted. There may be a home market, but this is all you can expect from the present, at least. Good port should be made in California, but I have seen none that would find favor in England. The reason seems to be that your port producers have never had the proper types to guide themselves by. It is my intention on my return to send back some ports to the Viticultural Commission which can serve as guides to the vineyardists having the most favorable conditions for port making. California brandy makers cannot disabuse their minds any too soon of the idea that fine brandy can be made from pomace and odds and ends of all descriptions. Some of the distillers are making a splendid article already, using wine as they should, but the utilization of pomace for fine brandy seems to have a firm grip on many. Pomace will make spirits, not brandy. With the vineyards of the Charentes devastated by phylloxera a fine opening is offered for the best brandies, but pomace spirit will not answer. On the whole, I may say that I am vastly pleased with the results of my trip. You have a wonderful country, naturally adapted to the production of the best types of wine. I had some prejudices against your State when I came, and particularly against your champagne. These have been wholly removed, and the studies which I have made in all the cellars have proved to me that there is a great future ahead for your viticultural interests. Prejudice may hinder its development, but let your wine makers strive only for the best, and sooner or later they will overcome all unreasoning objectors. Your wines will prove what the State can produce."

BUSINESS NOTES.

ACID DRINKS ON SULTRY DAYS.

At this sultry period of the season every imprudence in food or drink is likely to aggravate existing disorders of the system, and render it peculiarly liable to choleraic attacks or to the fatal effects of hot sunshine. In times of Asiatic cholera epidemics, very weak sulphuric acid, lemonade, or, what is equally good and much safer for the public, phosphoric acid, or, what is better, Horsford's Acid Phosphate, is recommended by experts as a preventive. Though happily we have now no menace of Asiatic cholera, a little of the prudence practised when it has been present would save many people from serious illness.

THE GREAT AMERICAN TEA COMPANY,

31 and 33 Vesey Street, New York, whose advertisement appears in our columns, is the oldest, largest, best and most responsible tea house in the business. They have been before the people of this country for the past thirty years, and to-day stand pre-eminent in the business of supplying consumers direct with pure goods only. We advise all our patrons and friends to give their goods a trial, and we guarantee they will be more than pleased. At the same time, they will have a treat enjoying a cup of good tea or coffee. We will state right here that the Great American Tea Company will do everything that they promise; that is how they have built up their reputation. In fact, they are headquarters in this country for Teas and Coffees, as they import direct, and thus save the profits of the middlemen.

VASELINE, OR PETROLATUM?

The manufacturers of vaseline have apparently come down from their high horse. They used to say that vaseline had obtained such a firm hold upon the medical profession and public, that nothing could displace it, and acted as independently as if the people would have to beg on their knees to obtain their vaseline. All this is changed now. The public has learned that vaseline is nothing but decolorized and deodorized pump-wax, or the residue of petroleum, and that one manufacturer can purify it as well as another, and that the best made is every bit as good, and some better, than vaseline, which only had the advantage of being known by the public, while they had not yet learned to know the product as petrolatum. The effect of this has been that the sales of the high priced vaseline have so largely fallen off that the Chesebrough Company are now eating humble pie, and, by dint of cringing advertisements, trying to regain the lost trade. They decry all other brands but theirs as imitations, and in a general way hint at their being irritant, noxious and sometimes poisonous. They even appeal to the fairmindedness of the public to protect them in their monopoly. Resort to another and very old dodge for driving out competition by cheapening the product under a different style of package is also had, and to clinch the matter, covert threats are made hinting at legal proceedings to defend the monopoly. You are too late, gentlemen; salt will not save you; no one sympathizes with you; you do not deserve any sympathy. You have always turned, disdainfully and insultingly, from the only influence that could help you—the public press; now it laughs at your calamity and mocks at your discomfiture.

LARGE SALARY.—The general manager of the Magazine du Louvre, the big Paris dry goods store, gets a salary of $30,000 a year, with a percentage on the profits.

RIPE BEER.—Walled up in the cellars of a brewery at Burton-on-Trent, there was discovered not long ago some beer which had been brewed in the year 1798. It resembled sherry more than it did a malt liquor, and was in good condition.

ELECTRIC POWER.—A feature of the International Electrical Exhibition in Frankfort will be the transmission of electric power. A firm in Laaffen, on the Neckar, will furnish currents of 500 horse-power over copper wires from a station 140 miles from the exhibition.

SUBMARINE BALL.—A trial has been made at Civita Vecchia of a nautical ball invented by Signor Balsamello. It is seven feet in diameter and can hold four persons. When closed it sinks, and is steered and propelled under water by rudder and screw. It has windows and grapplers, and, besides fishing up things, it may be used for destructive purposes in time of war.

BODY MAGNET.—In machine shops it is a frequent occurrence that particles of metal penetrate into the skin and eyes. Messrs. Frister & Rossman have, according to *Revue Industrielle*, constructed a magnet for the special purpose of extracting such particles. It is horseshoe shaped, polished and nickle-plated; the two branches are rounded off and end in a point only a few millimetres thick. Its attraction for iron extends for several millimetres.

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A BENEFICENT LAW.

On next Monday, September 1, a law goes into operation in this State making it a misdemeanor punishable by fine for any child "actually or apparently under sixteen years of age" to smoke or use tobacco in any form in any street or place of public resort. Our State lawmakers performed little legislation at their last winters' session so wise and salutary in its intent as this statute in opposition to juvenile imbecility and precocious vice, and it is to be earnestly hoped its provisions will be maintained by the authorities, strictly, unswervingly and to the letter. The small boy, with his gutter-found stump of a cigar or his nastier cigarette, has become of late a never-failing and ubiquitous nuisance. He infests the sidewalks and the street corners with his reeking abomination, and inundates the whole atmosphere with his sickening effluvium, in babyish emulation, that would be comical sometimes if it were not so nauseous always, of the more advanced puppy, who displays the measure of his manhood by making himself a paper-funnelled stink pot on the street car, the steamboat and the hotel porch, and at the entrance to the concert room and theatre. The prospect of this ineffable nuisance being even partially abated by the elimination of the most juvenile offenders is an encouragement to every lover of "God's oxygen" who is averse to having his lungs used as a sewer for diffusing poison and corruption through his vital system. There is reason to hope that this feeling of encouragement is not entirely baseless, so far as this city is concerned, in the fact that the Board of Aldermen on the 14th inst. adopted unanimously the following resolutions, which were at once forwarded to the Commissioners of Police:

Whereas, That the smoking of cigarettes on the cars, upon the streets and avenues, and in various places of public resort by boys, many of them of tender years, has become an intolerable nuisance; and

Whereas, Many of our most eminent medical men have inveighed against the evil effects of cigarette smoking, declaring that the habitual use of tobacco in this form is undermining the constitution of thousands of boys in this city and elsewhere; and

Whereas, The Legislature of the State, in its wisdom, has passed the following law: "No child actually or apparently under sixteen years of age shall smoke or in any way use a cigar or tobacco in any form whatsoever, in any public street, place or resort;" and

Whereas, The violation of the statute is made a misdemeanor punishable by a fine of not more than $10 nor less than $2; and

Whereas, This law goes into effect on the 1st of September, 1890; therefore

Resolved, That a copy of this preamble and resolution be transmited by the clerk of the Board to the Commissioners of Police with a request that instructions be given the police force to enforce the law by arresting such minors as they find using cigarettes or tobacco in any form upon the public streets or on or in any public place.

COOKING WITH GAS.

The gas stove has, we believe, a brilliant future in store. Its utility is gradually but steadily becoming recognized by observant housewives, in its relation to economy of both labor and expense, not to speak of the avoidance of discomfort which its substitution for the hot kitchen range or stove ensures in the summer months. That it meets all the requirements of the household has been repeatedly attested to by the public exhibitions given in this and other cities of the certainty and despatch with which it responds to every kind of culinary demand, the details of which are familiar to every reader of the AMERICAN ANALYST. We understand that in some of the improved residences recently erected in New York, particularly those of the "apartment" order, gas stoves have been placed in the kitchens in the stead of ranges, the hot-water pipes receiving their supply from the steam pumps and boilers connected with the elevators. This innovation will possibly become more popular when it is understood that it is "quite English," for the system referred to is in operation in London on a large and increasing scale. There are some features connected with the scheme in that metropolis which might be deserving of consideration here also. Thus, for example, one of the gaslight companies of London have upwards of 25,000 gas stoves in use, 20,000 of which are out on the rental plan. In April this company put out 1,684 stoves; 2,608 in May. The mean monthly growth is now about 2,000 stoves. The company place their stoves free of all charge to consumer, the average cost of the fitting and labor being within a fraction of $1.50. The company have gone at the supply of gas stoves in a thoroughly systematic manner, and have divided their territory up into three divisions, in each of which they have selected a centrally located hall wherein lectures on cookery are given by competent young women who instruct the company's patrons in the art of cooking by gas. These halls are fitted up with every conceivable kind of gas appliance for domestic purposes, and the attendants fully explain their uses. Until recently the company have abstained from entering the dwellings of its consumers, but the chief officials have come to the conclusion that past experience amply attests that it is not politic to leave the internal arrangements entirely in the hands of gasfitters, who have not the slightest interest in the matter after the fittings are up, and they have now taken the installation of stoves entirely from the jurisdiction of the gasfitters, and are doing the work themselves. In addition to the halls wherein cooking lectures are conducted, the company have, in each of the several divisions, thoroughly equipped sample rooms in which every conceivable character of gas-consuming appliance is on permanent exhibition.

CAST-IRON BRICKS.

Foreign technical papers have recently described a new building material which was invented and patented by a German mechanic. It is in the form and about the size of an ordinary brick, but is composed of cast iron and is hollow. The shell is so thin that the brick weighs less than one made of clay. A wall is built of these bricks without the use of mortar, and no skilled labor is required in laying them. The upper and lower sides of the bricks are provided with grooves and projecting ribs which fit into each other easily and perfectly and form a wall of great strength. There are also two large circular openings in the upper sides of each brick, arranged so as to receive suitably-formed projections on the lower side of the brick that is to be placed above it. One of them is hook-shaped, which ensures a solid hold. A wall of these bricks is very quickly put together. After the wall is built it is covered with paint. This closes all the cracks, renders the wall air-tight, and prevents the bricks from rusting. By using good paint the wall can be made highly ornamental. These bricks are very durable, and they possess other great advantages. A wall can be taken down or rebuilt as readily as it can

be put up. There will be no mortar to be knocked from them as there is when clay bricks are used. A building made of these bricks is cool in summer and warm in winter, for the large air spaces prevent the passage of heat. A building made of these bricks is as near fire-proof as can be. With a supply of these bricks a man can put up his own house and be entirely independent of the bricklayers', mortar mixers' and hod-carriers' unions. If he does not like his house, he can take it down and build another.

WEAR OF BRAIN WORK.

After a careful study of the subject, Dr. Allen Starr expresses it as his opinion that hard study is not a frequent cause of disease, that it is, instead, the anxiety attendant upon close competition, the emotional strain in connection with efforts to attain success, and not the study alone, which is the usual cause of nervous prostration—so that, if competition could be eliminated in education, the process could never be accused of producing disease. In his opinion fear of failure in examination, eager desire to excel in competing for honors or position or prizes, and the attendant emotional strain, are the chief causes of maladies usually attributed to over-study. Under such emotional strain, women, he asserts, give out more quickly than men, and from the effects they recover more slowly—this, again, being ascribable not entirely to inherent weakness on the part of the nervous system of women, but in part, to their very common neglect of the many precautions which prevent such a break-down, among these being proper diet, sufficient exercise, a careful regulation of digestion, and the relaxation from continuous work which should be enforced at certain periods.

HEAVY CHARGES.

THE COST OF FIRING A 110-TON GUN.

According to a calculation made by the *Economiste Belge*, the cost of firing a 110-ton gun is, in round numbers, $832, divided as follows: 990 pounds of powder, $380; 1,980 pound projectile, $435; Silk for cartridge, $17; $832. But this is not all. The 110-ton gun, it appears, can be fired but 95 times, and after that becomes incapable of being used, and requires repairs. Now, the costs of the piece being $82,400, it is necessary to estimate the costs of wear at about $868 for each shot, thus raising the cost of each charge to $1,700.

THE BRINY DEEP.

AN EXPERT'S VIEWS OF WHAT IS INVOLVED IN CROSSING THE ATLANTIC.

How few there are among our sixty or seventy millions of people who ever saw the sea; how few really comprehend what it was to sail from New York to Liverpool; and even how few of all those millions who have nearly all their lives resided in Boston, New York, Philadelphia, San Francisco and other great seaport cities who ever once saw an ocean steamer, or had the most meagre conception of the scenes in their own ports attendant upon getting away to Europe, or the strange and wonderful interest attaching to ordinary life and its environment upon one of the latest-built majestic coursers of the Atlantic. And so I thought, as I had always kept my eyes and ears open at sea, I might in all modesty say something informing and welcome about the starting and going to the Old World which, because that going will make of the one who goes a better citizen, ought to be every American's endeavor to effect.

While it is, perhaps, better to have gone only as far as Liverpool, and then come home again, than never to have gone at all, take the advice of an old and earnest traveler when he begs you never to go to Europe until you can go, so far as you do go, in complete leisure and perfect peace of mind. Along with the ethical equipment mentioned, one needs little else save money for a European trip, and not so very much of that. Any one with good sense, judgment and $600 can go and come in the best steamers, travel 1,000 miles in Great Britain or upon the continent, and live very decently for three months' time. As to the actual outfit, one is more comfortable the less that is provided. A whisp broom which can be carried in the hip pocket, a diminutive comb and brush, a tooth-brush, one complete change of clothing, with heavy underwear, an abundance of linen-faced collars and cuffs, a paper of two-sized pins, a half dozen collar buttons, shaving utensils, two or three blocks of linen writing paper with envelopes for the same (for there is untold annoyance in securing stationery on shipboard and in hotels), a "housewife" containing assorted needles, a tiny pair of good scissors, a few yards of white and colored thread and a bit of beeswax, and a good stout weather coat, are all that any male traveler actually needs. Women need everything under heaven their husband's bank account will permit them to carry along, in order to attempt the outshining of every other woman on shipboard or within the confines of the effete European dynasties. In New York the wharves of all the great ocean steamship lines—the Guion, National, Cunard, Anchor, French, Inman and White Star lines—are massed together in the order named along the North River, facing West Street. On nearly every week day a vessel departs; but on Wednesdays and Saturdays, the chief sailing days, the bustle and excitement are tremendous. Incoming and departing steamships constantly mingle their important and excessive activities. For a half-mile along West Street, facing the wharves, there is apparently inextricable confusion, but in reality wonderful discipline and order, in the handling of incoming and outgoing ocean freight. The hotels, chop-houses, saloons, telegraph offices and wharves are open night and day. There is no diminution of din, traffic and apparent hopeless confusion the whole night long.

As the sailing hour approaches, the great lines of drays and transfer wagons give way to lighter vehicles. These, laden with bon-bons, fruits and flowers, gifts to departing friends, look bright and pretty; but they are shortly displaced by as handsome a show of carriages as you will see on the sunniest day in Central Park. If your steamer sails on a bright afternoon, you may count more than a thousand of these. They bring departing passengers and a host of friends to wish them well. By this time all the decks are crowded by excited, laughing children. Everybody smiles, even if here and there a heart is breaking. One can barely hear his own voice for the din. Every ship's officer and steward is in his brightest uniform. The 'longshoremen, with wild yells and excited cursings, are stowing away driblets of overlate freight. Supplementary United States mails, without which your vessel cannot sail, are flung wildly on board. Suddenly the gong beats below. "All ashore, going ashore!" shout the stewards. It is a knell to merriment. Faces lengthen. A tremor is in the voice. You can hardly see your friends' faces now. Then the embraces, the hand-grasps, the lip pressures leal and true—ah, some of them the last precious earthly message of heart and soul to soul and heart! The captain on the bridge nods his head. Away go the forward lines. Then his hand pulls a stout cord. The fog horn roars and bellows, and the gang planks are cleared from the ship. Another nod from the captain and away the aft lines go. The great vessel slips back into the stream, her prow and stern seeming to reach half across the Hudson. One cannot call back to the pier there, if he would. The throat is too full and your heart hurts you so. Your eyes can make no one's face out clearly. Half a thousand ashore have pressed forward to the bulkheads. You can only see a mass of moving color, waving scarfs and handkerchiefs, and some who are reaching far and farther out, as if they must come to where you are. In a moment more you turn away heart-sick from it all. Shortly the pilot is discharged at Sandy Hook lightship; and before you get through revolving wild and fanciful plans of escape, the Highlands are flattening down upon the western horizon, and the great steamship is racing in her course across the sea. After one's steamer is well out of sight of land, your eyes begin to open to the fact that you are shut in upon the sea with an extraordinarily compact mass of humanity. Think of a little city of two thousand souls within less than the cubic space comprised in the dimensions of say 500 feet in length, 50 feet in width and 40 feet in depth!

And yet you are but one individual of the great number thus strangely environed. Indeed, a great ocean steamer is a large little world full of most interesting objects and activities. To begin with, going either way during the "season," there is likely to be 600 cabin passengers. The "steerages" and "intermediates" will together average 1,000 each way, the "steerages" immensely predominating toward New York, and the "intermediates" crowding the second cabins to overflowing on the passage to Liverpool. There are 1,600 in these three classes. Besides these, the crew number more officers, men and women than comprise a regular army regiment and the legitimate attaches of a post. There is the captain, or commander, and his right-hand man, the chief officer. From six to eight deck officers, ranking as first, second and third officers, are provided to assist in the navigation of the ship, and some of these under officers are on deck day and night. Those who may properly be called seamen among the crew are the boatswain, boatswain's mate and from 36 to 40 sailors. From twelve to fourteen of these are called quartermasters, who are detailed to steer the ship, stand lookout, and, as masters-at-arms, act as a sort of shipboard police squad. These sailors also include two ship's carpenters, who are riggers, plumbers and boilermakers as well, and who must hold themselves in readiness for labour at all hours of the day and night. In charge of the engine and machinery are a chief engineer and from 25 to 30 assistant engineers, five or six electricians, three or four donkeymen, 30 to 35 head firemen, and 50 to 60 common firemen. The latter shovel coal into the furnaces, and their work in hot weather is something fearful. The head firemen are called "greasers," and they oil and clean the machinery; while the donkeymen are foremen in charge of the boilers. In this class there also from 60 to 70 trimmers, who shovel the coal from the bunkers into the stoke-hole. In what might be termed the hotel department of the steamship there are from 150 to 200 people employed. There will be a purser, or accountant and paymaster, with one or two assistants; a surgeon—a vealy medical school graduate whose employment is an insult to intelligent people of standing, and a constant menace to the health of American and British ports—and an assistant; a first and second steward, and a chief stewardess. Under their supervision about 150 people are distributed according to the exigencies of the trip. There are four stewardesses for the first cabin, two in the second, and one, an individual who could out-blackguard a Galway fish-wife for aggression and defence, in the steerage. There are from 30 to 50 first cabin stewards or table-waiters. About 20 are stateroom stewards. There will be eight or ten deck stewards and porters; a half-dozen are required to wait on the officers and in the mess-rooms; there will be as many bell-boys, or "boots," all lads in their teens, usually pretty, nice little fellows from Birkenhead or other coastwise suburbs of Liverpool. Then in connection with the cuisine department there will be twelve or fourteen cooks, ten or twelve pantrymen, three or four "fleshers" or butchers, four bakers, two bartenders, five or six keepers of ship's stores, and a ship's printer, who prepares three menu cards daily. That stately monarch of men at sea, the ship's barber, must not be forgotten; he who shaves you for a quarter,

sells you pointers on the ship's daily run, insists upon your purchase of deck shoes, hats, caps and other uncanny devices, and at last confides to you, under favor of a final generous contribution, the names of the only hotels in all Europe that "any sure-enough American ge'mmen would be caught dead at."

When one begins to realize that he is only a two-thousandth part of the total aggregate humanity housed between decks upon one of the great Atlantic liners, the matter of what is required to provide for the needs of the great steamship itself and those of a small cityful of people for from a week to a possible two or three weeks' voyage, in the event of accident, is really worth an inquiry. How many people ever thought of the stupendous quantities of, and expenditure for, the two items of fresh water and coal required for one voyage, and then of their aggregate for a whole year's service? An entire interesting article might be written on the men and craft engaged in the ocean supply of fresh water in New York Harbor alone. There are owned in New York City, Jersey City and Brooklyn ten large steam vessels constantly and solely employed in this service. Each of these carries from 5,000 to 25,000 gallons of water. Besides, there is a fleet of from 25 to 30 single-masted sailing craft in the same traffic. The water is purchased from the three cities at an average price of 50 cents per 100 cubic feet (about 700 gallons), and is sold to sailing vessels at one cent per gallon, and to steamships for whatever can be got—many of the captains pocketing one-half of the total bills in rebates—but one-fourth of a cent per gallon is usually secured. Outgoing vessels "stock" with from 200 to 1,500 gallons, and the great steamers each take on 30,000 to 50,000 gallons. Many of the ocean leviathans load with 3,000 to 3,500 tons of coal for each trip. Averaging 26 crossings per year, the annual power required by one steamship is produced by the burning of from 78,000 to 91,000 tons of coal. But aside from these two startling items, think of the vast stores provided for the larder of only one ocean greyhound for a single passage. Two thousand souls, say 600 cabin and 1,000 steerage and intermediate passengers, with a crew of 400 souls, will consume, in round numbers, 13,000 pounds of beef, 2,000 pounds of corned beef, 7,000 pounds of mutton, 2,000 pounds of lamb, 1,000 pounds of veal, 700 pounds of pork, 3,000 pounds of fresh fish, 1,000 fowls, 500 chickens, 1,000 squabs, 200 ducks, 150 turkeys, 20 tons of potatoes, 200 bushels of various small vegetables, including peas, beans, lettuce, beets, spinach and cauliflower, besides 15,000 eggs, 500 bricks of ice cream, 2,500 quarts of milk, 250 pounds of sausages, 1,200 pounds of butter, and general groceries, including such items as 1,000 pounds of coffee, 450 pounds of tea, 1,000 pounds of white, 500 of pulverized and 1,500 of moist sugar, 2,000 pounds of ham, 1,000 pounds of cheese, 800 pounds of bacon, 250 pounds of rice, 300 jars of jam, jelly and marmalade, 200 bottles of pickles and sauces, 25 boxes of lemons, 30 boxes of oranges, from 40 to 50 barrels of flour, and tons of fine stuffs to tempt steamer passengers' critical palates, which the Germans wisely group under the general name of "delicatessen." But this is not all. The beer, wine, liquor and mineral water guzzling on shipboard and the consumption of cigars are enormous and beastly. The passengers of any one of the leading four lines will annually consume 10,000 bottles and 18,000 half-bottles of champagne, 12,000 bottles and 8,000 half-bottles of claret, 12,000 bottles of all other wines, 500,000 of ale and porter, 200,000 bottles of mineral waters, 40,000 bottles of brandy and other spirits, 35,000 pounds of tobacco, 75,000 cigars and 70,000 cigarettes. Ugh!—and is it any wonder that such as these are seasick? And what an unutterable pity there should be somewhere along the line for the other fellows who are irrevocably shut up where these human systems in desperate recovery are flinging off, amid the attars of all-permeating bilge water, the exudations and essences from the use and abuse of, say, 100,000 pounds of tobacco, and nearly one million bottles of glucose, fusil oil and sulphuric acid!

EDGAR L. WAKEMAN.

ADULTERATED BAKING POWDER.

A LIST OF THOSE CONTAINING ALUM AND AMMONIA.

Several cases have been published in the newspapers recently of persons being poisoned, in some instances fatally, by ammonia. The harmful effects of that article are well known to both chemists and physicians, and the public should be on its guard against anything in the shape of a food preparation that contains it as an ingredient. Strange as it may appear it is nevertheless the fact that ammonia, as well as alum, is extensively used in the manufacture of baking powders. For the information and guidance of the readers of the AMERICAN ANALYST we have prepared a list that will be found below of the alum and ammonia baking powders recorded as such in the official reports of the United States Government, the Canadian Government and the Food Commissioners of the States of Ohio, New Jersey and Massachusetts. The list is arranged alphabetically and is well worth preserving. Those to which a ✣ is appended are evidently largely in use, as they are mentioned in three or more of the reports referred to. The list is as follows:

American Gilt Edged.
Aunt Sally.
Brooks and McGeorge.
Brunswick.
Buckeye.
Burnett's Perfect.
Can't Be Beat.
Capitol.
Carlton.
Centennial.
Challenge.
Cook's Acme.
Cook's Best.
Cook's Choice.
Cook's Favorite.
Cook's Finest..
Coral.
Cottage.
Crown.
Crystal.
Daisy.
✣Davis O. K.
Dixon's.
Dooley's.
Dry Yeast.
Eclipse.
Empire.
Enterprise.
Eureka.
Feather Weight.
Fleur de Lis.
Forest City.
Four Ace.
Gem.
Geo. Washington.
Globe.
Gold.
Golden Sheaf.
Grape.
Great Eagle.
✣Henkol's.
Higgins.
Holyoke.
Hygienic.
International.
James.
Jersey.
✣Kenton.
Lincoln.
London.
Mason's.
Metropolitan.
Miles Premium.
Miles Prize.
New Era.
Ocean Foam.
Ocean Wave.
Old Colony.
One Spoon.
On Top.
Oriole.
Our Best.
Our Own.
✣Patapsco.
Pearsons.
Perfection.
Peerless.
Pride of Ottawa.
Pride of Toronto.
Princess.
Purity.
✣Royal.
Scioto.
Silver Cream.
Silver Queen.
Silver Spoon.
✣Silver Star.
Silver Thimble.
Snowdrift.
Sovereign.
Springfield.
Star.
State.
Standard.
✣Sterling.
Sun Flower.
Superior German.
Veteran.
Vienna.
Washington.
Welcome.
Wheeler's No. 15.
White Star.
Windsor.
Zipp's Grape Crystal.

There are many other adulterated baking powders which have a small local sale. The Minnesota Dairy and Food Commission, for instance, gives the names of forty-one not enumerated in the above list. But our readers must not imagine from the foregoing appalling category, that there is no such thing as a pure baking powder. The fact is that the wholesome leavening power of a baking powder is produced by cream of tartar and soda. Those articles, however, are comparatively expensive, and the dishonest and unscrupulous manufacturer sees larger profit by replacing them with cheaper ingredients regardless of the injury the use of the latter is calculated to involve. But there are, as the AMERICAN ANALYST has repeatedly shown, honest manufacturers of pure cream of tartar baking powder, who not only use only the purest and most desirable material in its composition, but who announce on the printed label on each package the names of the ingredients. One further word of caution to housekeepers. Every baking powder sold with a prize or a gift is almost certain to contain alum or ammonia, and often both.

BASE BALLS.

HOW THEY ARE MADE BY MACHINERY.

Automatic machines for making baseballs have been so successfully contrived that their introduction is likely to constitute a practical industry. Each machine winds two balls at one time, in the following way: A fine Para-rubber ball, weighing three-quarters of an ounce, around which one turn has been made with the end of a skein of an old-fashioned gray stocking yarn, is slipped into the machine, then another, after which the boy in charge touches a lever, the machine starts and the winding begins. The rubber ball is thus hidden in a few seconds, and in its place appears a little gray yarn ball that rapidly grows larger and larger. When it appears to be about half the size of the regulation baseball there is a click, the machine stops, the yarn is cut, the boy picks out the ball and tosses it into the basket. When this basket is full it is passed along to another boy, who runs a similar machine, where a half ounce layer of worsted yarn is put on. The next machine adds a layer of strong white cotton thread; a coating of rubber cement is next applied and a half-ounce layer of the very best fine worsted completes the ball with the exception of the cover.

A PERSUASIVE CURRENT.—The electric battery has superseded the hose and cold water treatment for taming refractory prisoners in the Ohio Penitentiary. It is reported to be very efficacious.

FINE CARROTS.—Jeweler: "My dear sir, that is not only a very handsome ring, but it is 18 karats fine."

Jersey Farmer: "I don't care if it's fifty carrots fine. Crops is good this year, an' Sally's goin' to wear that ring if they fine me everything I raise on the north lot!"

ELECTRICAL PERSUADER.—The use of electricity is offered to the lion-tamer in the form of a light wand, with an insulating grip for the hand, connected by a flexible wire with a battery of which the power can be varied at will. An experiment with this form of application has been successfully made.

WAVE MEASUREMENT.—The height of ocean waves has recently been measured in a very ingenious way by floating a sensitive aneroid barometer, to which a recording apparatus was fitted, on the surface of the water. It has thus been proved that waves attain a height of forty feet from trough to crest in a fairly heavy sea, and probably very much more in violent gales.

LUMINOUS PAINT.—Until now the commercial manufacture of luminous paint has been confined to England. Enormous cost seems to have prevented the use of the paint, except as a curiosity, and it is fortunate that a firm in Austria has found means to produce it and place it on the market at about one-sixth of the English price. Whenever it can absorb light during the day it will give it forth at night, and it is said that a railway car in England, which has had its ceiling painted with it, was so brilliantly illuminated that one could see in it during the darkest night without any other light.

COMPOUND LARD.

ADVANTAGES OF COTTON-SEED OIL IN LARD.

Professor Willis G. Tucker, the Analyst of the State Board of Health, has lately made an exhaustive report on the subject of the healthfulness of compound lards, which we present herewith to the readers of the AMERICAN ANALYST:

The main question, as I understand it, is, whether cotton-seed oil properly extracted and refined is a wholesome and nutritious article of food, and whether it is a proper substance to mingle with lard obtained from the fat of hogs or with other fats in the manufacture of "lard compounds," table oil and the like for use as food, or in the preparation or manufacture of food articles. There doubtless exists on the part of many people a prejudice that lard should be made from hog fat alone and table or salad-oil from the fruit of the olive-tree solely, but this opinion is in reality based on no good or sufficient reasons. Fats obtained from a variety of animals and a great number of plants have been used from time immemorial in the preparation of food, and it is unreasonable to suppose that those particular fats and oils which we, in this country, or in this part of the country, have been accustomed to use are the only suitable ones to employ. All over the world vegetable oils are obtained by the expression of seeds or fruits of plants, and used as food. From the cocoanut, brazilian nut, walnut, almond and a wide variety of other vegetable products oils are extracted and employed in the preparation of food. In speaking of the vegetable oils, Dr. Edward Smith, in his well-known work on "Foods," places cotton-seed oil at the head of the list, and says: "There can be no doubt that we have in this product of seeds and plants, which seem otherwise to be useless, a great storehouse of most valuable nutritive material; and if we know but little of them in this climate, it is because we have the olive-oil at hand, and are bountifully supplied with many kinds of animal fats. It is, however, probable that the cheapness of some of these vegetable oils, in addition to the delicacy of their flavor, will, ere long, force themselves into notice and obtain a place among our foods." This was written in 1873, when the manufacture of cotton-seed oil was still in its infancy. Professor Wiley, chemist to the United States Department of Agriculture, in Bulletin No. 13, on "Foods and Food Adulterants," quotes from Allen's well-known and standard work on "Commercial Organic Analysis," as follows: "Refined cotton-seed oil is of a straw or golden-yellow color, or occasionally nearly colorless. The density ranges from .922 to .926, and the solidifying point from one to 10 degrees centigrade. Refined cotton-seed oil is usually very free from acid, and when properly prepared is of pleasant taste and admirably adapted for edible and culinary purposes, for which it is now extensively employed, both with and without its nature being acknowledged." As regards the manufacture and refining of cotton-seed oil, it may be remarked that the methods employed are not materially different from the processes made use of in the preparation of olive oil. That cotton-seed oil has for years been exported to Italy and France, in which countries it is largely employed for mixing with olive oil, is a well-known fact. Speaking of cotton-seed oil, Dunham J. Crain, United States Consul at Milan, reported as follows under date of November 10, 1883: "The seed oil industry is assuming considerable proportions. Several kinds of this oil were exhibited at the Milan Exhibition in 1881, and classed among alimentary oils. There were some beautiful specimens of seasame oil exhibited. * * * The importation of cotton-seed oil was arrested in 1882, since which the demand for oleaginous seeds has increased. It is therefore urged that a duty should be imposed on all imports of seeds and seed oil, if it is to be continued on cotton-seed oil. It is claimed that the duty on cotton-seed oil has served no good purpose; that the mixing of cotton oil with olive was not prejudicial to health, and that the mixture is now made with oils from flax and nuts, and that the competition formerly coming from cotton oil has been replaced by oils of other seeds and by nut oils. * * * It is felt that frauds will diminish, and the public good be promoted, when prejudices against good seed oils disappear and they are sold under their true names." (United States Consular Reports, XII., 587.)

I am clearly of the opinion that cotton-seed oil whether used alone or commingled with other oils or fats is a perfectly wholesome and nutritious food, and as easily digested and assimilated as any of the commonly employed fats. In support of this view the opinion of numberless writers upon the subject and of experts in chemistry and psychology might be adduced, but I shall content myself with citing two or three. Battershall, in his treatise on "Food Adulteration," remarks: "As a result of the publicity lately given to the subject of food adulteration, a popular impression has been produced that any substance employed as an adulterant of, or a substitute for another, is to be avoided *per se.* Perhaps the common belief that for all purposes cotton-seed oil is inferior to olive oil, and oleomargarine to butter, is the most striking illustration of this tendency. Now as a matter of fact, pure cotton-seed oil, as at present found on the market, is less liable to become rancid than the product of the olive, and, for many culinary uses, it is at least quite as serviceable. * * * The sale of these products, *under their true name*, should not only be allowed, but under some circumstances even encouraged."

Professor Wiley stated before the United States House Committee on Agriculture, at the hearing on the compound lard bill in 1888, in reply to the question whether from his knowledge of chemistry and of medicine there is any property in cotton-seed oil injurious to health, that there was not, so far as he knew. In reply to the question, "Does that statement also apply to beef stearine used in connection with cotton-seed oil in the manufacture of refined lard?" he replied, "Yes, sir; so far as I know, there is nothing in it injurious to health." Concerning its digestibility and the ease with which it is assimilated, he instanced a case in which a pint had been given as a laxative, and had undergone perfect digestion, showing, in his opinion, "that it was very easily acted upon by the intestinal juices," and "very easily assimilated, and he added that "it seems to act on the digestive organs like olive oil precisely." In response to the question, "Are the nutritive qualities of cotton-seed oil equal to the nutritive qualities of pure lard?" He replied, "I should say that there would be little difference as far as nutritive properties are concerned." Professor Wiley analyzed a large number of samples of so-called refined lards, compounded chiefly of beef stearine, cotton-seed oil and hog fat, and in response to the question, "Have you any belief that any of these articles or specimens * * * when used as foods are hurtful or unhealthful to the human system?" replied, "I have no reason to believe any of them are, any of the ingredients in the lards." And again, "As far as medical and chemical knowledge extends, these substances are not injurious to health." In reply to the question, "What would you say of cotton-seed oil when used alone as an article of food?" he answered, "I should say that it was perfectly wholesome," and he gave it as his belief that it was as wholesome as olive oil or hog lard or beef fat. Professor S. P. Sharpless, State Assayer for Massachusetts, and a chemist who has given much time to the study of food adulteration, stated during the course of the same investigation, that he knew of no property injurious to health in cotton-seed oil or the refined lards which he had examined. Professor R. Ogden Doremus of New York City, states that refined lard made from steam lard, beef stearine and cotton-seed oil is "pure and wholesome," and that, in his opinion, "cotton-seed oil is a wholesome article of diet," and Professor L. M. Norton of the Massachusetts Institute of Technology, states that the compound lard made by a well-known firm is "a perfectly good food material," and "is unobjectionable in every respect, and does not contain anything which can be injurious to health."

These are the opinions which seem to be almost universally held by those who have investigated this subject from a scientific standpoint. So far as I know, there is no evidence worthy of the name which even remotely tends to show that cotton-seed oil is not a wholesome and nutritious food. It has, as a matter of fact, been used for years, both surreptitiously mixed with other oils and fats or openly employed on its merits as a palatable and useful food. Throughout the cotton-growing States it has been, for a long time, very largely used, and the medical faculty of the Arkansas University state that it is to be preferred to other fats in many repects, "agreeing with the most delicate stomachs, whether used in baking or frying," and that "not one instance has ever been given of health being in any manner impaired by the use, however free, of cotton-seed oil in food." They state that "thousands of hands employed in the cotton-seed oil mills are in the habit of making their dinners on the crude oil, by dipping their bread in it, and some of them actually drink it, and yet from this free use of it nothing has ever resulted but the best of health."

Such testimony as that given above is not easily overthrown. Writers of eminence in our scientific, medical and agricultural journals have borne similar testimony, and large numbers of people in our midst to-day use, by preference, in their households, a cotton-seed oil lard in place of one made from the fat of the hog. In my own family I have employed such a lard with perfect satisfaction, and am convinced by actual trial that it is palatable, readily digestible and a wholesome, nutritious article. During the last few years I have chemically examined a considerable number of compounded lards, sold as lard and under various trade names, containing cotton-seed oil, sometimes without a trace of hog fat, and I have also examined various qualities and grades of cotton-seed oil and of olive oil containing it, some of these examinations having been made within the last week, and I have discovered in these lard compounds and oils no substance injurious to health or in any way deleterious, and I am decidedly of the opinion that such lard compounds and cotton-seed oil products as I have examined or of which I have knowledge are wholesome and nutritious articles of food.

A GREAT BREWERY.

ONE HOUSE PRODUCING A THOUSAND BARRELS A DAY.

How many readers of the *Tribune* have ever visited a great brewing establishment? A little back from West Street stand the buildings of Beadleston & Woerz. From the river this pile of stone and brick resembles a huge fortress. Mr. Woerz said the other day, that he had the capacity to brew 500,000 barrels a year, but his present storage capacity limited him to a production of 300,000. Think of that, ye Drys! Does it not seem hopeless to attempt to stop this amber flood which flows at the rate of a barrel a minute down the throats of thirst these August days! The great chambers where the tanks stand, like miniature gasometers, are cool and sweet-smelling with an under aroma of hops, pungent and grateful to the senses. In the next room Mr. Woerz slides back a wooden covering and, swinging an electric lamp at the end of a cord, discloses the golden interior of a huge copper cauldron. There are three of these in this room; how deep and how capacious one does not inquire. They are empty now, and as clean and sweet as the sauce kettle of a good housewife. Now slip on this overcoat which hangs conveniently near. We are going from the tropics to the North Pole. This treshold separates Florida from Alaska. It is 90 deg. in the street and 30 deg. on the other side of this party wall. We enter, and muffled up as we are, the frost-charged atmosphere strikes terror to our vertebra. The sweat of our brow turns to hoar frost. From

August to December in an instant of time. The sudden anachronism oppresses us. For hundreds of feet in either direction loom tanks filled with beer—nothing but beer! You cannot see it, but you know it is there. It is the toper's dream of Elysium. In this cloister of Gambrinus everything is frosty and spectral. The walls are wainscoted with pipes, and the ceilings are hung with them. They carry the liquid ammonia, kept always in circulation by two great pumps on the ground floor. Every elbow and joint is covered with a fungus-like growth of ice and snow. It is impossible to realize that we are in the heart of a great city during the heat of summer. There are three or four of these floors devoted to beer and the Ice King. In them perpetual winter reigns, and those who work there know nothing of the season's change. We are glad to escape into an elevator and descend to a well where we are invited to quaff cool, refreshing draughts of the June brewing.—*Tribune.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

August.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock.

MEATS.—Beef, lamb, mutton, ham, kidneys, liver, sausage, veal, venison.

FRUITS.—Cherries, raspberries, huckleberries, melons, gooseberries, blackberries, peaches, pears, tamarinds, bananas, pineapple, grapes, plums.

FISH.—Anchovy, bass, bluefish, blackfish, cod, eels, crabs, clams, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, salmon, turtle, trout, sturgeon, whiting, weak-fish, rockfish.

VEGETABLES.—Beans, beets, cucumbers, cabbage, carrots, cauliflower, corn, egg-plant, lettuce, onions, parsley, parsnips, potatoes, squash, shallots, spinach, turnips, radish, rhubarb, tomatoes.

PRACTICAL RECIPES.

STEWED SHOULDER OF MUTTON.—Remove the bone from a shoulder of mutton, sprinkle it with pepper and salt, roll it up and tie it together. Make a rich gravy with the bones. Put the shoulder in a stewpan, pour the gravy over it, cover and stew until tender. Remove the strings before serving.

MEAT JELLY.—Chop fine one pound of lean mutton and one pound of rump steak. Put it in a jar, cover tightly and let it stand on the fire in a pan half full of water for three hours. Press the meat through a sieve and to it add sufficient gelatine, dissolved in water, to stiffen it, using one half ounce to a pint of meat essence; season. Remove the fat when cold.

CURRIED VEAL.—Boil three pounds of veal, cut into small pieces until tender, salting the water half an hour before it is done. Drain the meat and fry it with a large sliced onion in three large tablespoonfuls of butter. Add now to this a dash of nutmeg and two tablespoonfuls curry powder, and enough of the water in which the meat was cooked to make a good gravy. Thicken with flour and serve with boiled rice.

BANANA FRITTERS.—Beat the yolks of two eggs very light; to them add two good-sized bananas cut in pieces and beat to a pulp with the eggs; add one teaspoonful of sugar, two of melted butter, one-half cup of milk, whites of two eggs well beaten; one and a half cupfuls of flour, small teaspoonful of baking powder. Beat well with egg beater. Drop from spoon into boiling lard and fry a light brown.

WHITE CAKE.—Rub two cupfuls of sugar and one of butter to a cream; sift together one cupful of corn starch, two of flour, one and a half teaspoonfuls of baking powder. Add to the butter and sugar a cupful of milk, then the prepared flour, any desired flavoring, and lastly the whites of seven well-whipped eggs.

MACAROON ICE-CREAM.—Dry and crumble half a pound of macaroons; add them to one pint whipped cream, four ounces powdered sugar and the whites of six eggs beaten to a stiff froth. Mix thoroughly but lightly and freeze. When about to serve sprinkle macaroon crumbs over the cream.

SPONGE CAKE.—Beat together for half an hour six eggs and six ounces powdered sugar. Add grated rind and a little of the juice of a fresh lemon; stir in lightly six ounces of flour. Have ready buttered two small tins; pour in the mixture and bake in a moderate oven from three-quarters of an hour to one hour.

WHISTLING WOMEN.

A FEMININE ACCOMPLISHMENT GROWING IN FAVOR.

The proverbial bad end that awaits the whistling girl and crowing hen seems, after all, so far as this country is concerned, to have belonged to the category of sun myths, several American ladies of the present day having achieved both social and professional success by their proficiency as whistlers. It is a unique accomplishment, as incongruous at first suggestion as the notion of a society belle performing on the banjo. But who shall account for—or philosophize upon—fashionable "fads?" The rarest illustration of this new feminine achievement is afforded by a young and pretty New York girl, Miss Mabel Stevenson, who has developed a specialty of her own known as "bird-warbling." Her imitations of our native feathered songsters are so melodiously true to life that one might fancy her to be their instructress rather than their pupil. Miss Stevenson appeared several times at the Press Club receptions in this city last winter, and the success she thus inaugurated was emphasized by a brilliant series of drawing-room entertainments given during the summer before distinguished and fashionable audiences in London. Her art, however, is of a higher order than whistling. As regards the latter, we read in the N. Y. *World* that there is a plan among the girls of the Four Hundred in this city to learn to whistle. Not only this, but they propose to have the best instruction that can be obtained, and the "Fair American," Mrs. Shaw, is looked upon as their coming teacher. If that lady's foreign tour cannot be brought to a close early enough in the fall, another instructress will be secured. The leading spirit in the movement is Miss Sallie Hargous, and that the whistling fad will be part and parcel of New York society next winter is beyond question. As everybody knows, the success of Mrs. Shaw has been nothing less than phenomenal. She is at present whistling at the Court of St. Petersburg before the Czar of all the Russias. Her rival, Miss Ella Chamberlain, of Cambridge, Mass., has a local rather than an international reputation. She is personally a very attractive woman, and is extremely popular throughout the New England States and Canada. According to Tennie Dalton there is a new star in the horizon—a Miss Eugenia Richter, of Woodside, N. J. She is represented as a prodigy in all respects, is the supporting pillar of a happy family structure, and instructs a large class of young ladies in the art of whistling. She is said to be a "sentimental whistler," excelling in the pathetic ballads which appeal to the heart, although she has a large and varied repertoire. Then there is Miss Laura McManis, of Indianapolis, possessing all the charms and graces combined with exceptional whistling ability. She will not whistle unless she can clear $200 a week, and she is very much encouraged by the success of a recent "concert tour" through Canada. The list ends with the names of Mrs. Elizabet Seymour Hodgson, of Roanoke, Va., and Miss Mary Horton—the latter a step-sister of Mrs. Shaw. Mrs. Hodgson is an expert in whistling, imitating, without the slightest effort, any species of song bird. Miss Horton whistles beautifully herself, and has gained the reputation of a successful teacher.

THE BEST CYCLOPEDIA.

The twenty-third volume of Alden's Manifold Cyclopedia includes the titles from McCook to Memorial. Among the articles, we notice the biographies of many eminent men and women of early times, as well as those of the present day; also excellent descriptions of many large cities and towns. The volume treats very satisfactorily three States: Maine, Maryland and Massachusetts; and of foreign countries there are Madagascar, Madeira, Malta and Manitoba. Interesting subjects in other lines are: Machine Gun; Magic; Magna Charta; Magnetism, 19 pages; Mammalia, 10 pages; Man, 6 pages; Mangel-Wurzel; Manure, 4 pages; Marble; Marriage, 6 pages; and Masons (Free), about 5 pages. These are named only as samples of what the volume contains. The articles are brought down very nearly to date, many of them are illustrated, the style and arrangement are excellent, and the printing and binding are entirely satisfactory. The one thing about it which it is difficult to comprehend is how so valuable a work can be supplied for so low a price. For farmers, mechanics, teachers, students and the great mass of general readers the Manifold is far superior to any other Cyclopedia. Specimen pages will be sent free on application to the publishers, Garretson, Cox & Co., New York, Chicago and Atlanta.

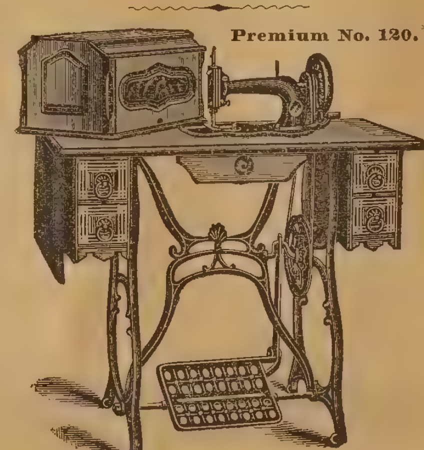
THE DEADLY GREEN APPLE.

The professional wit who makes fun of unripe fruit simply reflects the popular superstition that the latter is exceedingly unwholesome, if not dangerous, to the human system. Probably no product of nature has received more undeserved abuse, and certainly of none is there more ignorance at large. A few words of information on the subject may, therefore, be of value, if not of interest, to the reader. The process of nature we call ripening is, when stripped of technical terms, very simple. The hard, firm cells of, for example, the green apple, which enable it to defy the wind and many insect enemies, break down and become soft and plastic. A portion of the starch is changed into sugar. One or two complex bodies are converted into the delicate ethers which give the fruit its characteristic flavor and aroma. Last of all, the green coloring matter is partially altered into other tints. This change of ripening is even at its largest very limited. The fruit changes but little in its real characteristics. This truth is shown in many ways. Insects, birds and animals are as eager for unripe as ripe fruits, and find them equally wholesome and good. Every skilled housewife knows that green apples, pears, peaches, cherries, tomatoes, quinces and plums are far better for culinary use than are the same when matured. The peasant boy and farmer's girl eat not only unripe fruit, but, what is far more difficult of digestion, raw turnip, carrot, cabbage, beet and even sweet potato. The great preserve manufacturers of Europe and America use half-ripened fruit and vegetables for their finest goods, and find that the fully ripened will never make more than a second-class article. In menageries and zoological gardens better results are obtained by feeding gramnivorous animals with half-ripened than with fully-matured vegetables. What, then, is the reason of the prejudice against green fruit? Reason there must be, because there never yet was a prejudice or superstition but what was based somewhere or somehow on common sense. It lies in the fact that all immature vegetable food substances are aperient in character when used by people in good health, and become cathartic or even drastic when employed by those whose blood is impure. As the vast majority of mankind are careless, if not reckless, in re-

spect to health, and as this carelessness invariably produces humors of the blood and system, it is obvious that, under the circumstances, the use of unripe fruits would be attended with unpleasant results anyhow, and possibly with danger to health and life. For humors, or impurities, invariably intensify and aggregate any temporary or slight trouble. For instance, they convert a pin scratch into a painful sore or a mild and healthful evacuation into an exhausting dysentery. The evil done in such cases is incorrectly charged to the fruit eaten, and not to the diseased condition of him who eats it. It is in this manner that the green apple, the pink watermelon and the Morris-White peach have received their bad reputations—reputations which really belong to the recklessness of mankind in general. Despite the prejudice and the facts, unripe fruit is nevertheless attractive to adults and especially to children. What, then, is to be done? The answer suggests itself—purify the blood and invigorate the system. For the latter, exercise, good hours aud a wholesome diet will suffice; for the former, the best specific is Ayer's Sarsaparilla. Once introduced into the body, it breaks down and expels all foreign matter and impurities; it attacks and removes the debris of the system arising from wear and tear; it acts as a tonic upon the vital organs, and, above all, strengthens the liver, stomach and intestines. A man or woman whose physical frame is thus cleansed and purified by the Sarsaparilla can eat green fruit with impunity and likewise enjoyment. Besides this, he or she makes his or her body proof against the minor ills which go hand-in-hand with impure blood, viz., sick headache, biliousness, torpid liver, sluggish kidneys, choked pores, insomnia and nervousness. And these cause as much pain, sorrow and loss in life as all the green fruit put together.

Steel Wheels.—Carriage wheels are now being made from cold-rolled steel. The spokes are tubular and adjustable. The wheels are so put together that any part can be replaced without taking off the tire or felloe.

Canadian Settlers.—According to the returns of the Dominion Immigration Department, 811,210 immigrants settled in Canada between 1881 and 1889, yet the year-book just issued by the Federal Government claims an increase of only 730,046 in the Dominion's population since 1881. Allowing for natural increase, these figures indicate a very large exodus to the United States.



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CONTENTS.

PHONOGRAPH RISKS.

We read recently in one of our medical exchanges that the Philadelphia Park Commissioners have ordered the disuse of the public phonographs heretofore in use in Fairmount Park, on account of the danger of their serving to disseminate disease. This danger is doubtless very slight, like that of injury to the ear, and probably neither danger is worth consideration if the instrument is kept reasonably clean and used properly; but its promiscuous use in a public park does not seem to admit of perfect security in this respect, and the announcement that the phonograph company intends to substitute a plate ear-piece for the penetrating one now in use, avowedly for the reason that there are persons who object to the present form, goes to show that the Philadelphia Commissioners are not the only people who entertain the idea of danger in the phonograph.

PURE FOOD RECIPROCITY.

The State Department is actively striving to effect the removal of the severe restrictions imposed on American exports of cattle and hog products to European countries. Our hog products are now excluded by law from Germany and France, and our live cattle are practically excluded from England by quarantine regulations on account of the scare worked up in those countries some ten years ago in reference to the healthfulness of those products. The effort to have the restrictions reconsidered was begun, almost as soon as they were imposed, under the Administration of President Arthur, and had the cordial support of Mr. Blaine during his brief service as Secretary of State, and his Assistant-Secretary, the Hon. R. R. Hitt of Illinois. The subject was revived early in this Administration. Instructions were given to Ministers Phelps at Berlin, Reid at Paris, and Lincoln at London to lay this subject before the governments to which they are accredited, as forcibly as circumstances will permit. Some delays occurred in each case, and only recently Secretary Rusk of the Department of Agriculture addressed a communication to the Secretary of State, calling attention to the regulations and prohibitory restrictions in force. Secretary Rusk declared them to be "to the great detriment and in some cases to the destruction of the trade in live animals and meat products from the United States," and requested the Secretary of State "to take such action as may be possible looking to a removal of such restrictions or their modification in favor of American producers." Meanwhile, Minister Reid had been working, and on August 15th the Senate was placed in possession of the correspondence relating to the efforts made by our government to secure the modification or repeal by France of the decree of 1881 prohibiting the importation into the latter country of American pork and kindred products. It then transpired that the French Government practically places its exclusion of our pork products upon economic instead of sanitary grounds, and that this policy of exclusion, as a measure for the protection of the domestic products of France, is applied only to the United States. Mr. Reid added to this statement of the facts in the case the significant suggestion that the American consumption of French wines largely exceeds the probable importation of American pork into France in case the duty were removed. Our readers are aware that the French Senate has been debating upon a measure to prevent the excessive adulteration in French wines. The United States has a large and rapidly developing wine industry upon the Pacific coast, and it might be necessary for sanitary reasons to prohibit the further introduction of the adulterated article from abroad. Mr. Blaine's reciprocity doctrines seemed admirably adapted to the situation, and on August 20th the bill providing for the inspection of salted pork or bacon intended for export was passed by both houses, with the following important clause added:

"That whenever the President is satisfied that there is good reason to believe that any importation is being made or is about to be made into the United States from any foreign country of any article used for human food or drink that is adulterated to any extent dangerous to the health or welfare of the people of the United States, or any of them, he may issue his proclamation suspending the importation of such articles from such country for such period of time as he may think necessary to prevent such importation, and during such period it shall be unlawful to import into the United States from the countries designated in the proclamation of the President any of the articles the importation of which is so suspended."

THE HELP PROBLEM.

Our esteemed contemporary, the *Journal of Commerce*, inquires plaintively, What shall be done for the towns and smaller cities and the rural districts which are now almost destitute of domestic servants? The question is, indeed, a serious one, and others besides our contemporary are concerned in its solution. The women who come to America as immigrants are naturally clannish, and like to stay where they can associate freely with their own people, and where they have religious privileges of their own selection. The native-born American girls will not go out to service, and if they do, as a rule, they are not desirable additions to a well-regulated household. It is impossible to meet their ideas of equality in the family economy. They will not believe that they are not held as inferiors unless they have all the rights and privileges of the most favored member of the establishment. It is impossible to concede this while they retain the occupation for which they are engaged. If they sit at the table with the family, there will be no one to serve, and any distinction of mistress and servant they regard as a personal degradation. In some of the western cities of this State the scarcity of persons who can be hired to render efficient service in the house has induced some employers to send to the South for colored help, as the only possible solution of the difficulty. In Western Pennsylvania, and from thence all through the Western States, there is no class from which servants can be drawn who will accept the situation, with its appropriate duties and responsibilities. Those who propose to check the tide of immigration will do well to hold their hand until a larger supply of this raw material has been landed to meet this constant and imperative demand. The *Journal of Commerce* says that that journal is in constant receipt of letters from all parts of the country asking if it cannot send out a body of young women willing to accept situations as servants in country homes, where they will be well paid and kindly treated. All that are likely to land on our shores for the next two years, if they were here to-day, could find places at once throughout the interior, provided they were willing to leave the seaboard, and still a part of the want would be unsupplied. Many feeble wives and mothers are wearing out their lives over the cook-stove and wash-tub because none can be hired to give them a respite from this incessant toil.

NATIONAL BEVERAGES.

THE LIQUID INDULGENCES OF ALL COUNTRIES.

The drinks or beverages of the people of all countries are usually derived from some indigenous vegetable product, such as grains, roots, the sap of trees, the juice of fruits, etc., and it would seem as if many of these must have been popular for unknown generations. Some of these beverages are said to be moderately pleasant, others highly intoxicating, while no doubt a large number evidently derive their popularity from the same principle that makes nasty American patent medicines tolerable, viz., from the varying amount of alcoholic spirit which they contain. A brief glance at some of the less-known national drinks in the light of their composition may not be out of place in this season of thirst and relaxation. One fact may be noted which is as true of the best-known drinks as those about to be considered, and that is that it is extremely difficult to obtain any palatable, refreshing drink without a small portion of alcohol forming part of its constituents. It may be said, also, that the manufacture and consumption of drinks depend much upon the supply of raw material available, although in rich and civilized countries the home deficiency can easily be supplied by importations. In some localities cider is popular and cheap. The percentage of alcohol in cider ranges from 5½ to 9 per cent., the latter proportion, however, being largely exceeded in the very "hard" varieties. The production of cider in France varies considerably year by year. It is largely produced, however, and principally consumed in the country districts, very little being exported. The best cider is said to be made in Normandy, where it was introduced many years since by the Moors; but cider is made in no fewer than fifty-four departments of France. Cider and perry (the latter being made from pears) are also largely made in England; while in the United States and the Dominion of Canada the former is very largely produced, being the favorite beverage of the farmer, and the only one which is more or less alcoholic that the temperance politician has at all tolerated. In Chili, after making cider and wine from their apples, they extract from the refuse a white and finely flavored spirit, and by another process they procure a sweet syrup, or, as they term it, honey. When properly fermented and prepared, the black mulberry yields a pleasant vinous liquor. In the cider counties of England mulberries are sometimes mixed with apples to form a beverage known as mulberry cider. The fishermen of Newfoundland, Labrador and the Gulf of St. Lawrence, and indeed many of the people living in that region drink large quantities of spruce beer. It is considered a corrective of the fishermen's diet, which consists largely of salt pork and fish. The process of making it is simple. Black spruce branches in sufficient quantity are chopped into small pieces and put into a pot containing six or eight gallons of water and boiled for some time. The liquor is then strained and put into a cask that will contain eighteen gallons. Molasses is added in the proportion of one gallon to eighteen gallons of liquor. A pint of the grounds of the last brewing and a few hops, if at hand, are also put in, and the cask is filled up with cold water and left to ferment. In twenty-four hours it is fit for use. Spirits are frequently mixed with spruce beer to make the drink called "callibugus." In New Zealand a drink somewhat resembling spruce beer is made from the twigs of the dracrydium taxifolium; it was used by Capt. Cook. From the sap of the birch tree some of the tribes of Northern Russia prepare their ordinary drink, "birkenwasser," from which they also make vinegar; and in some districts they boil it into a sweet syrup, which serves them instead of sugar. For those who are too poor to drink beer or mead this northern wine is the only potive drink. A drink delightfully acid and refreshing is made in Brazil from the pulp of the capsule which envelops the seed of the cacao theobroma. The saccharine liquor extracted from the unexpanded flowers of the Ita palm of British Guiana is said to afford a liquor resembling champagne in its briskness. The sap of the Sontar palm is obtained from the stems of the bunches of fruit when cut. This liquor is drunk either fresh or after it has undergone a slight fermentation. It bears also the name of towak or palm wine. Sometimes a species of strychnos is infused with it, which produces a stupefying and intoxicating beverage, sold daily in the bazaars in Molluccas, especially in Amboyna, in sections of bamboo. Palm wines are common in most warm climates. In the Eastern Archipelago the wine is obtained from the gomuti palm. The principal production of this palm is toddy (from the Sanscrit tade), which is obtained in the following manner: One of the spadices is, on the first appearance of the fruit, beaten on three successive days with a small stick, with a view of determining the flow of sap to the wounded part. The spadix is then cut a little way from its root or base, and the liquor which pours out is received in pots of earthenware and sections of bamboo or other vessels. When newly drawn the liquor is clear, and in taste resembles fresh mint. In a very short time it becomes turbid, whitish, and somewhat acid, and quickly runs into the vinous fermentation, acquiring an intoxicating quality. In this state great quantities are consumed. In Ceylon, Madras, and other parts of India toddy is obtained from the sap of the palmyra palm, and there are two kinds—the unfermented juice called sweet toddy and the fermented or "culloo." The sap of the wine palm, called "boardon" and "lope," is much relished by the savage tribes of West Africa. Other of their favorite inebriants are "wawa," or plantain wine, and "bombe," small beer made of grain. The latter is served in neatly carved and colored gourds, and the contents are imbibed through a reed. The cool, refreshing milk of the cocoanut is highly esteemed, and many other palms are brought into requisition for beverages. In Siam, China and Japan rice is the principal grain used for distilling, and forms the "lan" of Siam, the "shonchon" and "mandarin" wine of China, the "sake" of Japan, and the "badek" and "brom" of Java. In China the rice wine they use is by no means agreeable. It is always taken hot, and somewhat resembles Madeira wine in color and taste. The Malays have a fermented liquor made from rice which they call "gelang." The Javanese liquor, "brom," is prepared from the fermentation of rice, and is a kind of beer, and not the product of distillation. The fine arrack (a name derived from "arak," the Arabic word for ardent spirit) is an invention and manufacture of the Chinese, of which materials are boiled rice, molasses, and palm wine. Sago, or rice beer, is the principal and almost only alcoholic beverage of Japan. Until the last two or three centuries sake was not manufactured on a large scale, but each household made its own supply. Now there are very large breweries of this liquor in different parts of the country. There are a great many varieties of sake to be obtained in commerce, differing somewhat in taste, flavor and price, and distinguished by fancy names. The proportion of alcohol in sake varies from 5 to 15 per cent. The sake of Japan is very heating and heavy, and appears to be as vinous in quality and strength as European ale or beer. It is flavored with honey or sugar. The Indians of Chili make a drink of maize or corn. The grain is first baked, then steeped in water for a certain time, after which it is boiled and set by to settle, and when fined it is fit to drink. Indian corn is largely used for distillation throughout North America, and in South America it appears to have been made into "chica" or maize beer at a very remote period, for it was a common drink of the Indians before the Spanish conquest. The liquor is said to be of a dark yellow color, with an agreeable, slightly bitter taste. It is in universal demand on the west coast of South America, and is consumed in large quantities by the mountain Indians. Scarcely a single hut in the interior is without a jar of this favorite liquor. From the stalks of the Indian corn a liquor is also obtained in Mexico. In some of the Rio Plata States the inhabitants make a liquor from the sweet pods of the Algarroba (prosopis alba), which, when new, is refreshing, but becomes alcoholized after fermentation. In some districts this liquor is the principal attraction at social meetings. Murwa beer, which is a product of the Himalayas, is made in this way. Millet seed is moistened and fermented for two days. Sufficient for a day's allowance is then put into a vessel of wickerwork lined with indi-rubber to make it water-tight, and boiling water is poured on it with a ladle or gourd from a huge iron cauldron that stands all day over the fire. The fluid, when quite fresh, tastes like negus of Cape sherry, rather sour. In some parts of the East a fiery, intoxicating beverage is made of jaggerberry (sugar), bhang (hemp), poppy seeds, pepper, cardomoms, and nutmeg. The fermented juice of the peach gives an excellent brandy, which is chiefly manufactured in the United States. "Peach and honey" was a favorite Southern tipple, before temperance societies took root in the "sacred soil." In the southern parts of Hungary the well-known liquor "shivowitza" is made from the shiva plum. The liquor called "maraschina," which is chiefly manufactured in the Italian States and Dalmatia, is prepared from a variety of cherry. The fruit and seed are crushed together, one part of honey to the hundred added, and the whole mass subjected to fermentation, during which process it is distilled. The kernel of the cherry contains the elements of hydrocyanic acid, and accordingly is much used for communicating its peculiar flavor to brandy and liquors. From the succulent peduncle or fruit of the cashew nut an excellent spirit has been distilled, with diuretic properties similar to the best Holland gin. A wine made from it resembles in taste an ordinary claret sweetened with sugar, and is a popular beverage among the poorer people of South America. It is the custom of the Brazilians to suck a cashew before breakfast, but at any hour of the day the juice is delightful. It is sweet and delicious, slightly astringent, and a wonderful allayer of thirst. The juice of one cashew is said to be more grateful to a thirsty person than a goblet of purest water. The Australian aborigines obtained a fermented liquor by soaking the seed vessels of the paudanus and washing out the sweet, mealy substance contained in the lower part between the fibres. The national drink of the Mexicans is "pulque," the fermented sap of the maguay, or American agave plant. After obtaining the juice, which is still largely done in the primitive way by cutting the flower stem of the plant and making a basin or depression, where it is taken from, and sucking up the juice into reeds, which are discharged into pigskins, it is carried to vats made of rawhide for fermentation. The sap, which resembles cider, and has a very disagreeable smell, taken alone or diluted with water, is a common

sweet beverage in use in Mexico. When fermented, this liquor is very intoxicating, containing about 36 per cent. of alcohol. To strangers both the taste and the smell of pulque are horrible, something in smell like rotten eggs; but people seem to get accustomed to its flavor, and like it, as the natives do. Bayard Taylor thus speaks of it: "I can only liken the taste of the beverage to a distillation of sour milk (if there can be such a thing) strongly tinctured with cayenne and hartshorn." And yet it is a national drink, and the taste for it, once acquired, it is a kind of nectar in its way, a sort of liquid limburger cheese.

FATAL TO FLIES.

NATURE HAS PROVIDED A FUNGUS THAT FIXES THEM.

Like many other insects, house flies are subject to the attacks of a parasitic fungus which destroys great numbers of them, especially toward the end of autumn. We sometimes see the corpses of such as have met this fate glued to the window panes in the attitude of life, with legs widely spread and wings raised as if in preparation for flight, but with a white halo on the glass all round them, and with bodies pale, unhealthy looking and distended. The spores of the fungus, which are excessively minute and are present in the air, are carried against the fly's body, and such as strike its under surface may become adherent, when each spore sends out a long tubular projection, which penetrates the skin and body. Once here, its host's doom is certain, says *Knowledge*, for it meets with suitable nourishment in the shape of the fluids of the fly's body, by aid of which it will speedily propagate itself until its victim, drained of its life's support, finally succumbs. The thread-like tube first produces a series of detached, rounded bodies, something like the cells of the yeast plant. These cells, which have an indefinite power of self-multiplication, are carried by the blood to all parts of the body, and thus the disease spreads. They, in their turn, give rise to a number of branching tubular threads, similar to those of the earlier stage, which in process of time penetrate the skin. Each thread which thus makes its appearance outside gives rise to a sort of head, which contains spores like those with which the series started. These are cast off with considerable force, and multitudes of them no doubt perish, while others are ultimately wafted against the bodies of other flies, to deal destruction among them as among their predecessors. The particular species of fungus which makes havoc with the house flies is called Empusa muscæ, and is one of a group which are distinguished by their habit of subsisting upon living insects. The maturation of the fungus involves the death of the fly, the fluids of whose body serve as food for the parasite. Under its attack the fly becomes gradually feebler, and finally quite unable to move, and then the viscid secretion from the pads on the feet hardens and glues the insect to the surface to which it is clinging, while the fungus spreads round it and leaves some of its spores adhering so as to form the halo above described.

INSECT PESTS.

BEETLES AND BUGS THAT DESTROY THE HOUSEKEEPER'S COMFORT.

For some centuries past a mysterious farming industry has been carried on in Persia and Dalmatia which has supplied the world with powder for the destruction of insects. For hundreds of years the nature of this powder remained unknown, the secret being handed down from father to son. All that any one understood was that the stuff produced was of a vegetable nature, and that it was simply deadly to insects of every kind. But, where commercial enterprises are concerned, secrets are apt to come out. Monks brought silkworms, prohibited of export, from China into Europe, enclosed in walking-staffs. Some day the ingredients of "India ink" will be divulged. In 1828 an Armenian merchant named Jumtikoff succeeded in getting hold of the insect powder secret and began manufacturing the product in Trans-Caucasia. But, not lacking appreciation of the value of his knowledge, he made no communication on the subject, and travellers and consuls tried in vain for years after to obtain the precious information. Seeds of the plants were repeatedly brought and planted in European soil; but they would not grow, for the simple reason—as was subsequently discovered—that they all had been carefully baked by the ingenious Persians and Dalmatians before exporting them. Naturally this interfered with the result; but finally a United States consul did secure a few unbaked seeds of the plant in 1880, and during the next year the Department of Agriculture circulated them widely. Strangely enough, however, only one farm established for the preservation of the plant exists at present in this country. It is located near Stockton, Cal., is three hundred acres in area, and produces a very large part of the insect powder at present used in the United States. The insect powder plant is so much like a common field daisy that you would hardly know the difference. In Persia it has red petals, but in Dalmatia white petals; the Dalmatian variety is the sort cultivated in California. It is planted in the spring, and the plants are transplanted into rows before the winter rains begin. From the second year on they bear profitably. It is ignorantly supposed that the powder employed is merely the pollen; but the fact is that it is obtained by grinding up the entire flower, petals and all. Men collect the flowers by cutting them off from the plants in bunches with stems, using a sharp knife for that purpose. The picker takes the flowers to a sort of iron comb, with teeth just big enough to accommodate the stems; he introduces the blossoms to the comb, gives a jerk, and the flower parts roll off into a basket, while the stems are thrown aside. Thus gathered, the flower heads are sent in sacks to a mill in Stockton, where they are ground by millstones and passed through fine sieves, so that only the finest powder falls through, to be put up in cans for market. When the factory in California was first started, in 1876, the price of its product was $16 a pound; now it is sold at retail for forty cents a pound. Scientific men think it very curious that human beings should not be affected by a powder so destructive to insect life. Undoubtedly, the "pyrethrum," as the plant is called, contains a volatile oil, the fumes from which when it evaporates kill the insects by asphyxia. It is most deadly to bees, ants, wasps and other high-grade insects; but bugs of all kinds succumb to its effects, the "carpet beetle" among the rest. This carpet beetle, which has chosen Washington as the first place to make its appearance in as a domestic destroyer, is destined soon to spread through all American cities; at all events, the Division of Entomology in the Department of Agriculture so declares. It hides in cracks and eats canals through the carpets, much as does the buffalo bug, which it resembles somewhat. Curiously enough, by the way, the buffalo bug does not live in this city at all; it only thrives north of the Baltimore latitude and has not thus far got further west than Chicago, though it already swarms in all the towns between New York and the metropolis by the lake. It was introduced to this country from Europe, of which it is a native, in 1874, being brought over to Boston in a batch of carpets consigned to a firm in that city. Ohio has only known it during the last two or three years. Doubtless it will reach the Pacific coast before long. It is an interesting fact that the new carpet beetle is not a novelty as a pest; it has been known for a long time past, but only as a "museum destroyer," addicted to attacking anything edible to be found in collections, such as dried spiders, stuffed birds, and skeletons out of which the grease has not been thoroughly dried. This bug has seriously damaged the million-dollar royal cloak of feathers brought hither from the Sandwich Islands and now on exhibition in the National Museum. It is a melancholy thing to record the fact that bugs imported from abroad almost invariably drive out the native American insects of like species by the operation of the law which determines the survival of the fittest. This has been the case of the domestic cockroach. The common black cockroach in this country to-day is an immigrant from the shores of the Mediterranean, very bold and fierce, and is much given to travel, so that it is often called the "ship cockroach." It has made its way all over the world, and within the last few years has almost driven the brown American cockroach, once so numerous, out of existence. The fate of the brown cockroach closely resembles that of the black rat, which has been wiped off the surface of this continent by the bigger brown "ship rat" from Persia. The brown cockroach grows to be about as big as the black cockroach—an inch in length, that is—but the European cockroach has been familiar with the conditions of civilization for many more centuries, and is thus better able to adapt himself to circumstances as he finds them here; hence his survival, according to Professor Riley's theory. The most successful cockroach in this country to-day is the so-called "Croton bug," which came from Germany, and first excited attention at the time when the laying of the Croton water pipes gave opportunities for the distribution of the species. Notwithstanding popular prejudice to the contrary, the cockroach is an insect of very cleanly habits; it takes the greatest care of its person and is constantly engaged in washing itself, as a cat does, drawing its antennæ through its jaws, to moisten them. Not all cockroaches live in dark and dirty places. There is a kind, native to the West Indies, that lives in the tops of trees and shrubs. The cockroach, ground up, is included in the German pharmacopœia as a vermifuge. Persian insect powder, by the way, has been discovered recently to be an infallible remedy for tapeworm, taken in ten successive hourly doses of a teaspoonful each; it is altogether harmless. The cockroach is declared to be the oldest of air-breathing animals. Fossils of the insect found in the coal beds are so vastly numerous that the carboniferous epoch is sometimes referred to as the Age of Cockroaches. Many varieties of giant cockroaches are found in the tropics that grow to be four inches in length and fly like birds.

A SOLID LOT.

A MOUNTAIN OF SALT IN LOUISIANA.

A mass of 90,000,000 tons of pure, solid, compact rock salt, located on an island 185 feet high, which rises from a miserable sea marsh on the route from Brashear to New Iberia, up the River Teche in Louisiana, is one of the wonders of the world. How this island, which contains 300 acres of excellent land, ever came into existence in such a locality is a matter of conjecture. Vegetation is prolific and the scenery is beautiful and varied. In the centre of this island, which is the only solid spot in the vast expanse of sea marsh for miles around, rises Salt Peak, the largest body of exposed rock salt in the world. Having never been surveyed its exact extent is, as yet, unknown; however, Engineer Brown, who has but recently visited it, says there is not less than 90,000,000 tons of pure crystal salt in sight. The dazzling clearness of Salt Peak forms a striking contrast with somber lagoons, bayous and salt marshes which surround it on all sides.—*St. Louis Republic.*

PRACTICAL CHEMISTRY.—An explosion and fire at Antwerp reduced to a charred mass a bundle of one-thousand-florin Austrian obligations. Without presentation in some identifiable form there could be no payment. The imperilled obligations were given to a chemist, and he succeeded in separating the whole of them and finding out the numbers; and upon his report the money has been paid. Capitalists owe innumerable obligations to science.

THE CIGAR BOX.

HOW THE CHARACTER OF ITS CONTENTS IS DESCRIBED OUTSIDE.

Few men know that the history of a cigar can be traced accurately by its box. The box is like the trunk that a man takes around with him through Europe. Every time that it is put into the baggage van of a train it gets a tab showing where it is going. The hotel keepers add their tabs and the steamers paste on theirs. The tabs show what kind of a traveller a man is. If he goes in the steerage, his baggage has a paster of one color, while if he is in the cabin his baggage has a paster of another color. A good deal can be told about a man from these pasters; a great deal more can be told from his empty cigar boxes. They are all opened differently if they are bought unopened by the man who smokes them, for no two individual smokers open cigar boxes alike, any more than any two smokers hold cigars in exactly the same way between their teeth and puff in exactly the same manner. Some men's cigars burn crooked, others burn even. Some of them open their cigar boxes with a penknife, and break the blade while they do it; others take a hatchet, others carefully cut the stamps and pry the box open by degrees. This shows whether they are impetuous, obstinate, conservative or emphatic. To a much greater degree than the empty cigar box shows the character of the man the brands and stamps on it show the kind of cigars that he smokes. There are any number of sizes and shapes of cigar boxes—the small twenty-five box, where the cigars are worth eighteen to fifty cents apiece; the larger fifty boxes, which may hold domestic cigars not worth one-quarter as much as the smaller boxes; the big box of 100 small cigars, and the mammoth boxes that hold 250. These boxes bear their history on them. They are all made of cedar, in the first place, sawed and planed to a quarter of an inch thickness, and tacked together with canvas strips to make the hinges of the lid. That is what the cigar box is in its crude state. Then it goes to the manufacturer, who has his lithographs and brands put on it. The better workmanship and the better lithography usually go with the inferior cigar. The imported lithographs are cruder, not so well drawn nor so well tinted as those on domestic cigars, but they have a different and more costly look to them. The tint of the paper also shows whether the cigar is imported or not, for the Havana manufacturers do not pack their cigars in paper of the same tints that the domestic manufacturers do. These inferior wrappings and lithographs tell about the cigar when the box is opened, but more can be told about it from the outside. It requires somewhat close observation to note all the marks on a cigar box. On a box of imported cigars, for instance, there is branded the mark of the manufacturer. That is usually the name of some factory, and the place where the factory is. The name of the factory gives an indication about its location. The brand "Campa Gral de Tabaco de Filipinas" shows unmistakably where the cigars that were put in that box were made, unless the brand is a counterfeit. It is seldom that counterfeit brands are found on imported cigars, as the import stamp is a guarantee that the cigar has gone through the Custom House. This stamp is put on first. Each of the Havana factories has its stamp—the Garcia, the Clay, the Carolina, or whatever it may be, on the lid of the box. It may be hid afterwards by the revenue stamp and lithographs, but the first thing done is to brand that name on. The Havana cigars frequently have stamped on them also "Habana," with the Spanish abbreviation designating the quality of tobacco or the size. This is put on them when the boxes are sorted out to be filled. The stamp of the factory is put on them in the first place. This stamp also is not branded like the factory stamp, but is put on with a stencil. The name of the factory cannot be taken off without planing into the lid, but the brand of the quality and color can. Before the cigars are put in, the box is further branded with the color, "claro," "colorado claro," "colorado," "colorado maduro," "maduro," or, as known to Americans, very mild, mild, medium, fairly strong, and strong. These are not enough grades to mark the various distinctions in color and strength, but they are generally approximated. Some brands of colorado claro cigars are milder than the claro cigars of other brands, but the mildest ones are always put into the claro boxes. There has been some change in the strictness of marking in recent years caused by the fact the American trade prefers colorado claro and claro to the maduro and colorado maduro. When the box has been marked in this way it is filled and the final tacks are put in. The manufacturer usually then pastes some advertisements on it in order that the box may not be opened and other cigars substituted without its being evident to the purchaser. Manufacturers have labels which they paste over the seams, which contain advertisements and notices of various kinds. If the manufacturer has taken prizes at any international exhibition, fac-similes of the medals will probably be found on the label. Usually there is a picture of the factory, with the firm name, coat of arms, and other designs. In this shape the box is ready to be sent here. It arrives with tens of thousands of other boxes and is examined by an inspector. He pastes over it the import stamp so that the box cannot be opened without destroying the stamp. The import stamp certifies the number of cigars in the box and that the tax is paid. Besides that there are blank spaces on the stamp which the inspector fills out with a stencil. When filled up the stamp shows not only that the cigars went through the Custom House, but the steamer in which they came, the port at which they were entered, the date at which they were received and stamped, and the name of the inspector who stamped them. This is an unfailing certificate of the length of time the cigar has been in this country. The stamps are finely made, in order to prevent counterfeit. There is more tracery and vignette work than on the ordinary revenue stamp. When the import stamp has been pasted on the box, the internal revenue stamp is put on before the cigars can be sold. The internal revenue stamp is a cheaper affair on bluish-green paper. It is cancelled at the same time that it is put on, and with a stamp which, if it were plain, might show the date; but this stamping is done much more hastily, and does not aid in the history of the cigar. A cigar box with an internal revenue stamp on it and no import stamp does not once in 50,000 times contain imported cigars, smuggled or otherwise. Some of the fictitious smugglers who go around among down-town offices and peddle cigars which they say are imported, produce them in boxes with only the internal revenue stamp on. Smuggled cigars have no stamps whatever. Any cigars that go through Custom House have the imported stamp and the internal revenue stamp both. A cigar which has only an internal revenue stamp has been stamped at some domestic factory. If it was smuggled it was taken to a factory to be stamped, which would be foolishness and waste of money on the part of the smuggler, and besides he would run a great deal of risk, as the internal revenue officer who stamped the box could readily tell, if he was an expert in his business, the difference between the boxes used in the Havana trade and the boxes used in the domestic trade. There are details in the way of packing, lithographing and branding which show unmistakably, unless they are very cleverly counterfeited. A man who is going to buy cigars, and wants to be sure of what he is getting, can tell by the box if it has not been opened. It is more risk to take an opened box, for some unscrupulous dealers will put cheaper cigars into a box which held high grade cigars and sell them as imported cigars. Still these dealers often make mistakes, as it is hard for them to get the same size of domestic cigars and the same color. If a man is buying what is said to be an imported cigar, and sees that the cigar is dark while the box is marked claro, he may be sure that there is some imposition somewhere, probably that the dealer in refilling the box was not careful enough to put in cigars of the same color. But the best way to do is to examine the box first and then to have the dealer open it afterward to see if the cigars are what is wanted. The age of the cigar can be told from the import stamp, the color from the brand on the back of the box, the factory from the factory brand, and the shape from the size of the box. Almost everything about cigars which go through the standard Havana factories can be told without opening the box. A cigar box with the blue label of the Cigarmakers' International Union does not hold imported but domestic cigars. Domestic cigars can further be told by an examination of the bottom of the box and the stamp and the warning not to use the box again, which has on it the district and the number of the factory. According to law, this warning must be on the box. It is a sure sign of a domestic cigar. —*Sun*.

BAKING POWDER.

SOME HINTS TO THE PUBLIC AS TO ITS PURITY.

It is but natural for a manufacturer to puff his own goods, and the public are willing to make a liberal allowance for exaggeration in such cases, but in the advertising of baking powder one company has gone too far. According to their advertisement, the only sure way of being saved from being poisoned is to buy their powder exclusively. This cheeky demand is backed up by garbled reports from all official sources and apparently endorsed by chemists of all kinds of repute, generally having the bogus title, "Government chemist" added to their names. Suffice it to say that this company, which so loudly proclaims the virtues of its powder, is the only one who now use ammonia for the purpose of increasing the leavening power in a cheap way, regardless of the public's objection to what it has been instructed to consider an unsavory addition to food. One of our exchanges says:

"If this kind of thing keeps up, the retailer will be under the necessity, if he is not to handle alleged unwholesome goods, either of putting up baking powders under his own brand or of advising his customers to concoct their own powders The latter plan is the most feasible and perhaps the most profitable for the retailer, as he can supply all the ingredients and make a fair profit on each. As to its feasibility, we submit the following extracts from the Government report on baking powders issued last year:

"'DOMESTIC BAKING POWDERS.

"'It may be asked, Cannot the consumer make up his own baking powders? The difficulties in the way of doing this may be enumerated as follows:

"'(1) The chemicals in the market, as purchased by the consumer, may not be pure, or of full strength, so that when combined in proper proportions they do not give good results.

"'(2) The proper proportions to use, and the necessity of thorough mixing to secure good results, would not be well understood by any one who was not a chemist.

"'(3) In order to prevent the action of the ingredients upon one another, and to preserve the strength of the powder unimpaired as long as possible, the manufacturer dries all his chemicals before mixing them, so as to drive off most of the adhering moisture. Baking soda cannot be dried much, as it loses its carbonic acid, and consequently its efficiency, at very low temperature. The starch, however, containing as it does from 10 to 18 per cent. of moisture, can be thoroughly dried at 100 deg. to 105 deg. C., and its efficiency as a filling material increased. The cream of tartar can also be thoroughly dried. This operation of drying chemicals at a temperature below that at which decomposition would occur seems rather too elaborate an operation for the kitchen.

"'These difficulties are more apparent than real, however. In answer to the first, it may be said that the bitartarate is the only chemical which is likely to be adulterated, and, as there is no difficulty nowadays in obtaining a pure article in the wholesale market, it only requires the proper enforcement of adulteration laws to oblige the retailer to furnish a good article. The second objection may be met by furnishing the public simple formulæ for compounding such powders, and the third, which is doubtless the most serious, I believe can be overcome by using a larger proportion of filling, without drying the chemicals.'"

The Government report, so broadly endorsing the purity of the cream of tartar generally found in the market, makes funny reading in the light of a report lately made by the N. Y. State Analyst, Dr. Willis G. Tucker, on cream of tartar. He says:

"One hundred and fifteen samples collected from retail grocery stores in the City of Albany, exclusively, were examined, previous investigation having shown that a pure article is almost invariably sold by druggists. The results of the examination of these samples will be surprising to those who are not informed upon this subject, for only thirty of the samples, or 26 per cent. of the total number, consisted of real and unadulterated cream of tartar. With the exception of six samples, rated as fair, in which the amount of adulterants was comparatively small, the remaining eighty-five samples were either largely adulterated or entirely fictitious. Of this number, nineteen, rated as inferior, was adulterated either with starch, acid phosphate of lime or sulphate of lime in varying quantities, not less than 80 per cent. of the adulterant or make-weight being present in some instances. Fifty-eight of the samples were entirely fictitious, of which number ten were chiefly acid phosphate of lime (containing considerable sulphate), twenty-three were chiefly acid phosphate of lime and starch, eleven were chiefly tartaric acid and sulphate of lime, and fourteen consisted of tartaric acid, sulphate of lime and starch. Two samples consisted of poor baking powder, sold by mistake for cream of tartar. The sale of such miserable imitations for real cream of tartar is evidently without excuse, and as the fraudulent substitute is frequently sold at the price of the genuine, with perhaps less than a quarter, and seldom more than half, of its strength, it is evident that the purchaser is both deceived and defrauded. These substitutes are to be condemned also as being, in all probability, less wholesome than the article they replace."

Home-made baking powders concocted from such cream of tartar, or from the oxalic acid tartar lately exposed by us, would be neither wholesome nor cheap.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

September.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock.

MEATS.—Beef, mutton, lamb, veal, ham, kidneys, liver, venison.

FRUITS.—Apples, bananas, blackberries, gooseberries, huckleberries, grapes, melons, oranges, peaches, pears, pineapples, plums, raspberries, currants.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, rockfish, salmon, trout, sea bass, sturgeon, turtle, white fish, whiting.

VEGETABLES.—Beets, beans, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips.

PRACTICAL RECIPES.

ANNA'S CHOCOLATE CARAMELS.—One cake of chocolate, three pounds of brown sugar, one cupful of molasses, one and a half cupfuls cream, piece of butter the size of an egg, one tablespoonful of vanilla.

PLAIN CAKE.—Beat together three scant cupfuls sugar and one cupful butter; add well-beaten yolks of six eggs, mixed with two tablespoonfuls milk; add one cupful flour, then not quite a cup of milk and three cupfuls more of flour, with which two heaping teaspoonfuls of baking powder have been sifted twice; add the well-beaten whites of six eggs alternately with the flour; flavor if you wish; stir thoroughly but gently; bake in two good-sized pans.

CORN MEAL PONE.—Mix into one quart fine corn meal, one tablespoonful salt and one tablespoonful sweet lard; add enough warm water to make a middling thick batter; stir in half a teacup yeast, and set to rise for eight or ten hours; pour in a pan and bake.

BREAD PUDDING.—Beat thoroughly the yolks of four eggs and the whites of two; take one quart sweet milk, put to it one large cupful bread crumbs which have been soaked in some of the milk, one cupful sugar and the beaten eggs; mix and pour in a baking dish; bake, and when done make a meringue of two whites and a little powdered sugar; spread over the top, put in the oven for a few minutes, take out, eat cold.

CHOPS AND TOMATOES.—Broil some French chops over a clear fire, turning almost constantly, for nine or ten minutes; melt some butter and season it highly with salt and pepper; remove the chops from the fire and baste them on both sides with the butter; set them aside; take a can of tomatoes and stew them with a sliced onion for about twenty minutes; add a lump of butter the size of a walnut, pepper and salt to taste and a dash of cloves; thicken with flour rubbed in a little water to the consistency of thick cream; strain through a sieve. Now take your chops, dip them in an egg which has been beaten, and a tablespoonful of hot water added to it, then in fine bread crumbs, and fry them a fine brown in drippings or in half lard and half butter; dust them with pepper and salt; pour the hot tomato sauce on a very hot platter, arrange the chops about it, garnish with parsley and serve immediately.

APRICOT BLANCMANGE.—Sweeten thoroughly a can of apricots and set aside; put one quart milk to boil in a farina kettle; when it comes to the boiling point add two tablespoonfuls corn starch wet with milk; beat thoroughly four eggs and to them add one cupful sugar; when the milk begins to thicken pour it over the eggs slowly so as not to curdle, and stir carefully all the time; return the mixture to the farina kettle and cook for about two minutes; have ready half a package or one ounce of gelatine that has been soaked in a little cold water for half an hour, and then dissolved in one-half cup of warm milk; pour the boiling mixture over this, beat well and let it cool. Drain the apricots from the syrup; wet a jelly mold, pour into it a cup of the custard, then add a layer of the fruit; set on the ice for a quarter of an hour, then add more custard and more apricots, treat this as before, and so gradually fill the mould; when it stiffens turn out on a glass dish, pour the syrup drained from the apricots over it and serve.

SEEING UNDER WATER.

THE APPEARANCE OF THE BOTTOM OF THE SEA.

Mr. Hermann Fol, in a lecture upon "The Impressions of a Diver," delivered before the Nautical Club, of Nice, and published in full in the *Revue Scientifique*, gives, among other things, some interesting observations made by him upon submarine vision by means of the diving suit with which the laboratory installed by him at Nice is provided. According to Mr. Fol, the illumination of the bottom of the sea resembles that of a room without windows, which receives its light from a glazed aperture in the centre of the ceiling. If the diver, after reaching the bottom, looks upward, he will see a large circular, luminous space, that may be considered as the base of an inverted cone, of which his eye occupies the apex. The periphery of this circle is more or less ragged, since the surface is never absolutely calm. The rays of the sun are pale, and penetrate in moving waves that resemble what we see in a room near the sea side when the Venetian blinds are down and the rays of the sun, reflected from the movable surface, illuminate the ceiling. The diminution in the intensity of the solar rays is very rapid, and at about 95 feet they are almost completely diffused. At the moment that the sun is descending toward the horizon such a darkness suddenly supervenes that one would be led to think that night had arrived. There is an angle at which the proportion of the rays reflected to those refracted becomes so unfavorable to the latter that the illumination of the bottom abruptly diminishes. The transparency of the water varies greatly along the coast from one day to another. When the water is relatively clear it absorbs so much light that, at a depth of 95 feet, when the sky is overcast, it is impossible to see plainly enough to capture very small animals. It is impossible under such circumstances to distinguish a rock at a distance of more than 25 or 26 feet in a horizontal direction. If the sun is shining and the water is limpid, it is possible to see a brilliant object at a distance of 65 feet, perhaps even at 75 feet. But, under ordinary circumstances, it is necessary to be content with half of these figures. Mr. Fol concludes from these facts that marine animals move about as if in a fog, and cannot avoid surprises. Our fishing apparatus would prove unavailable for capturing animals that were capable of seeing to some distance. There is another point that Mr. Fol insists upon, and that is that a submarine boat cannot see its way under such circumstances. Provided it be swift, it will not have time to back astern when it sees some large obstacle loom up before it, since, at the moment of distinguishing the object, the boat would not be more than 30 feet distant therefrom. It will always be obliged to get its direction before plunging, and to navigate over a known ground, whose bearing has been carefully taken. Submarine navigation is thus confined within limits that man cannot widen, since it is impossible for him to modify the transparency of the water. The color of the water varies from blue to greenish, according to its degree of clearness. Even at a depth of 30 feet objects take on a bluish tint, and at 75 or 95 feet the light is already so blue that animals of a dark red color, such as the *Murex plalomus*, appear to be black, while the green and bluish algæ seem very light in comparison. Upon rapidly ascending to the surface the ærial landscape appears red to the eye that has got accustomed to this blue light. The red rays are the first ones extinguished. It is the blue rays that, being the least absorbed, penetrate to the greatest depth, and it is precisely these rays that act with the most energy upon the photographic plate. Thus fall the objections that certain scientists, with a persistency that does no credit to their notions of physics, have urged against the use of the photographic plate for finding to what depth daylight penetrates water.

PUMICE STONE.

A NEW SUPPLY RECENTLY INTRODUCED.

A mine of pumice stone exists on the Teneriffe Peak, of which the working was only started in 1888. The stone is found in that part of the peak called the "Canadas," at about 2,000 feet above sea level, which has an area of some 6,000 hectares, out of the middle of which rises the highest part of the peak. The Russian consul at St. Croix bought this property of the Spanish government in consideration of an annual payment for the pumice stone working. The Russian consul has associated himself with a Belgian, and they, under the firm styled Aguilar & Valcke, commenced operations in 1888, but it was only last year exportation was really started. At the Paris exhibition, the consul general states that this stone obtained a silver medal, and in view of the requirements of England, France and America, he believes it will develop a trade of great importance before many years. So far, the Lipari Islands have practically furnished the world's supply of this product, exporting about 100,000 tons per annum. The Teneriffe stone being recognized as of excellent quality, and its extraction being a much more simple matter than in the Lipari Islands, it follows that the price is much less.—*Scientific American.*

PLATT'S CHLORIDES.—Dr. Adolph Tscheppe, in the *Pharmaceutische Rundschau*, publishes a valuable contribution on some analyses made by him of certain proprietary articles. Among others he refers as follows to the much-advertised Platt's Chlorides: "The label mentions as principal ingredients potassium and magnesium chlorides, when in fact aluminium, zinc and sodium salts are the constituents of this disinfectant. Besides hydrochloric acid it also contains notable proportions of sulphuric acid in combination. The following analytical data are mentioned: It took 10.8 ccm. of normal solution of soda to saturate 10 grammes, a voluminous precipitate being simultaneously produced. By means of ammonia in excess were obtained 0.2 of aluminium hydrate from 5 grammes. Hydrogen sulphide produced in the filtrate 0.15 of zinc sulphide, with barium 5 grammes yielded a precipitate of 0.21 barium sulphate. The percentage composition then is:

12,4 Al Cl + 12 H O (aluminium chloride).
4.2 ZnCl (fused zinc chloride).
5.6 NaCl (sodium chloride).

But since aluminium chloride would be too costly, it is produced by the double decomposition of aluminium sulphate and calcium chloride, the amount of the latter required being exactly one-half of the former. This accounts for the presence of insoluble calcium sulphate in the commercial preparation. To make such a fluid, then, take of

Aluminium sulphate	parts	170
Zinc chloride................	"	42
Sodium chloride..............	"	56
Calcium chloride.............	"	85
Water enough to make........	"	1000

Dissolve the aluminium and calcium salts separately, then mix and allow to settle. In the clear supernatant liquid dissolve the other ingredients." The only remark that needs to be made is, that, like many other things, Platt's Chlorides are not what they seem to be.

WOMEN'S RIGHTS.

THERE WAS ONE PRESENT WHO FILLED THE BILL.

"Is there a man in all this audience," demanded the female lecturer on women's right fiercely, "that has ever done anything to lighten the burden resting on his wife's shoulders? What do you know of woman's work? Is there a man here," she continued, folding her arms and looking over her audience with superb scorn, "that has ever got up in the morning, leaving his tired, worn-out wife to enjoy her slumbers, gone quietly down-stairs, made the fire, cooked his own breakfast, sewed the missing buttons on the children's clothes, darned the family stockings, scoured the pots and kettles, cleaned and filled the lamps, swept the kitchen, and done all this, if necessary, day after day, uncomplainingly? If there is such a man in this audience let him rise up. I should like to see him!" And away back in the rear of the hall a mild-looking man in spectacles, in obedience to the summons, timidly arose. He was the husband of the eloquent speaker. It was the first chance he had ever had to assert himself.

FASHIONABLE EXTRAVAGANCES.—A list of extravagances of the London season cites an expenditure of $25,000 for a concert, $10,000 for the presents in a cotillon, $5,000 for the flowers at a single ball, and $1,500 for the orchids at a dinner party.

TOO MANY NAMES.—Eighteen words have come into the language—probably temporarily, most of them—to denote the act or state of electric killing. They are as follows: electromort, thanelectrize, thanatelectrize, thanatelectrisis, electrophon, electricise, electrotony, electrophony, electroctony, electroctasy, electricide, electropœnize, electrothenese, electroed, electrocution, fulmen, voltacuss and electrostrike.—*Garratt.*

MONEY ORDER POSTAL CARD.—Germany and Austria intend to increase the facilities of the postal traffic. Amounts of one gulden (Austrian money) or two marke (German money), or less, may be transmitted in future by buying postage stamps for the amount required, which are posted on the back of a card, where they are canceled at the post-office, like a postage stamp on the front of a card which pays for the postage. The addressee of such a card takes it to his post-office, and receives the amount indicated by the postage stamp on the back of his card.

SAFE CHIMNEYS.—Chimneys, to be safe from fire and draw well, should be not less than sixteen inches square inside and built up from the cellar. Use good brick with clay, instead of mortar, up to the comb. Plaster it inside with clay mixed with salt. Top with the best brick, well wet and laid in cement. Do not let wood come too close to the brick, and don't let the stovepipe come nearer than eighteen inches to the ceiling.

ELECTRIC MOTORS.—Six years ago there were scarcely a hundred electric motors in operation in the United States for any purpose; to-day there are no less than 15,000 motors in use applied to not less than two hundred different industries, and an industrial revolution is taking place, equalling, if not surpassing, in importance that attending the introductton of the steam engine, and marvellous in the rapidity of its growth.

AMERICAN ANALYST

A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

COMPOUND LARD.

Our national legislators have found themselves in an embarrassing dilemma in the compound lard matter. The Conger bill, the character of which was set forth to the readers of the AMERICAN ANALYST in our issues of March 13 and 20, has, as we then predicted, encountered vigorous opposition. Purporting to be formed in the interest of the farmer, it turns out, on closer inspection, to have been concocted exclusively for the benefit of the large pork-packing houses, whose advantage is obviously not synonymous with the payment of larger prices to the agriculturist. It is, in fact, one of the most unqualified specimens of reprehensible class legislation that has been introduced in Congress since the unjust and, as we still believe, the unconstitutional oleomargarine bill was presented, as its manifest intent is to tax out of existence a legitimate industry built up for the manufacture of a wholesome commodity whose growing acceptance has shown it to be a dangerous competitor for the trade in the varied and dubious mixtures that go under the name of "pure" and "genuine" hog's lard. But the gingerly manner in which the compound lard bill was treated when it came up last week for passage in the lower house of Congress revealed the true inwardness and real iniquity of the measure. Its discussion at the time was, in a word, merely a political scheme intended to curry favor with the agricultural community, in order to capture their votes in the forthcoming autumn elections. The dodge was to assure the agricultural voters that the sole purpose of the bill was to widen the market for their productions, and under cover of that representation to excite an earnest antagonism against the reelection of every member who had not given it his adhesion and support. We say nothing about the political attributes of this bill, the effect of which would evidently be to pit the hog products of the North against the development of cotton-seed industries in the South. It is sufficient to denounce it as a rascally effort of rascally demagogues to honeyfugle the farming interests into connivance with a measure designed for their harm rather than for their advantage. Special class legislation of this kind cannot, in the nature of things, be of benefit to any other than the special class in whose favor it is concocted. We should be pleased to learn the precise extent to which the American farmer has increased his income through the instrumentality of the oleomargarine law. We do not believe that any one has profited through that iniquitous piece of Congressional injustice except the capitalists who control and direct the current of trade. The original producer of the raw unmanufactured material is left helplessly in the lurch. The Conger bill, thanks to this political whip-lash, finally passed the house, but it is doubtful if it will ever make its exit from the committee room of the Senate.

FALSE ADVERTISEMENTS.

Our daily journals contain advertisements from which we quote the following: "The Standard Cocoa of Europe, the Coming One of America. Van Houten's has *fifty per cent.* more of the flesh-forming elements of cocoa than is obtained by the best processes of other manufacturers." This is an advertisement of Van Houten's cocoa. We have no fault to find if this manufacturer chooses to style his cocoa the standard cocoa of Europe. Standard of what? He adds the coming one of America. We do not believe this. Americans have been educated by our most excellent home manufacturers to look upon any cocoa containing a large quantity of cocoa shell as adulterated and unfit for human food, much less as a standard. The claim that this cocoa contains fifty per cent. more of the flesh-forming elements of cocoa than is obtained by the best processes of other manufacturers is absolutely false, as the AMERICAN ANALYST has abundantly proven in previous issues. Van Houten's cocoa is made by the same processes as all other Dutch cocoas, and is not any better, though perhaps not any worse. None of them come anywhere near the purity, strength, flavor or quality of our old American favorite, Walter Baker & Co.'s. When the Van Houten cocoa is no longer advertised it will never be heard from again, as at double the price of better American products, it cannot hold its own.

A WONDERFUL CASE.

INTELLECTUAL DEVELOPMENT OF A CHILD BEREFT OF SIGHT AND HEARING.

On the outskirts of the town of Sheffield, Alabama, lives a little girl named Helen Keller who, according to the following account written by a correspondent of the *Chicago Herald* exhibits the most remarkable case of mind training and nurse skill that is to-day known. This case is so strange, in fact, so thrilling in reality and startling in development, that many who read this account will doubt the truth thereof.

Helen Keller was born June 27, 1880, at the old Keller Homestead in Tuscumbia, where for several generations the family has lived. Helen is the scion of two prominent families; the paternal side is cavalier, the maternal being puritan. She is the daughter of Colonel Arthur H. Keller, who enjoys the distinction of having fired the first gun of the rebellion that was heard in Alabama, the shot being fired from the bluff at Sheffield at the pilot of a federal gunboat. The father of Colonel Keller hauled by team from Philadelphia, Pa., to Knoxville, Tenn., and by flatboat down the river, the first load of goods ever brought to York Bluff, now Sheffield, in 1817, when General Andrew Jackson decided to build a city where Sheffield now stands. The grandfather of Colonel Keller and the grandmother of General Robert E. Lee were brother and sister. The mother of Helen and Miss Kate Adams, a daughter of General Charles Adams, of Memphis, Tenn., who was a lineal descendant of the historic Massachusetts family of that name. Mrs. Keller is a cousin of Edward Everett Hale. So much for genealogy to give credence to the facts of this story. In infancy Helen was a most remarkably bright child, quick, intelligent and of robust health. She bade fair to be only one of many brilliant children of such noted parentage. There was not a defect in one of all her senses. She was a perfect child, physically and mentally. There was not a cloud on her young life and her future seemed peculiarly bright. When nineteen months old Helen was stricken with a very serious attack of iritis, and while she was ill only four or five days, on her recovery it was found that she had lost the senses of sight, speech and hearing, and was left in total darkness for all time. This was what the family feared. Many known physicians of renown were consulted without even holding out hope. The child was growing physically, and the violent efforts she made to be understood proved that her

mind was clear and unimpaired. At times she would make sign after sign, and failing to be comprehended she would be miserable and melancholy. In 1887 Colonel Keller wrote Dr. Anagnos, son-in-law of Dr. Howe, who founded an institution for deaf-mutes in Boston and who educated Laura Bridgeman, the most celebrated case in medical science. Dr. Anagnos is at the head of the Boston Institution, founded by his father-in-law. Colonel Keller's only hope was to get a trained teacher who understood caring for deaf-mutes. He applied for one, and Miss Annie Sullivan was recommended. Miss Sullivan had been blind until her fifteenth year, but was cured by heroic surgery. An arrangement was made with Miss Sullivan and she came and took charge of Helen, then in her seventh year. At the first sitting the child was taught several object lessons by the sense of touch. She was an expert sign-maker, and when the first lesson was given she seemed delighted, and realized the deliverance had come. Miss Sullivan begun by taking her hand and putting it on an object, the first being Colonel Keller's hat, and in the mute alphabet spelling it out. Soon Helen grasped the situation and gleefully clapped her hands in joy. One object after another was placed in her reach and she was told what they were. Not once did she forget a single lesson or the name of an object. After several such object lessons Miss Sullivan taught her the alphabet, and then an upward flight in knowledge was taken that surpriseed even her parents and teacher, while all who were watching the case marveled as if a miracle was being performed in their midst, and, indeed, it was a miracle, for a child who was deprived of three essential senses and who was bereft of all power to make her wants and wishes known to communicate with others in any way was using in the short space of three months a smooth-flowing, rich and correct vocabulary of 2,500 to 3,000 words, and could converse fluently with any one who had mastered the deaf-mute language. It was noticed that the child was not only bright, but absolutely correct in some things, the power of which is unknown. After once being introduced to a gentleman, lady or child, she never forgot it, even though a long time had passed since the introduction, she would instantly recognize and tell who it was, where they met, the circumstances of the meeting in all detail, as soon as their hands touched. She had settled the question of age in more instances than one, for there are many who know her intuition on such, while, phenomenal and inexplicable, is absolutely correct. Most of the two years past Helen spent in Boston, and having entree to the elite, she met very prominent men and women, to all of whom she was a mystery interesting, a study unexplained. Dr. Oliver Wendell Holmes was her prime favorite, and the two had long and deep talks on various subjects, but on the second reference to the matter Dr. Holmes in every instance said that the child had not only understood and retained the sense of the conversation, but also had grasped and remembered the most minute details. The venerable poet, John G. Whittier, spent hours studying the mysterious child, and while he was conversing with and studying her she was absorbing knowledge, expanding in thought and taking in a wider range of information of the deep and the beautiful, until her mind is an unfinished poem, following in the trend of the pure of nature and the virtuous of thought. She can quote poem after poem from standard writers, but she most frequently quotes from Whittier. In July last Helen was allowed to take part in the commencement exercises of the school, although she was below the age allowed to take part. Among the children were some as old as eighteen. One of the subjects given them was to tell what they knew of New York. The exercises were public and no teacher to prompt. None of a large class of girls, some of whom were eighteen or nineteen, wrote more than one page, and Helen wrote seven pages, winding up her descriptive essay with: "New York is called a cosmopolitan city because the people of all nations live there." The written exercises were then on entomology, and the essay written by Helen covered seventeen pages. This had to be done in the presence of the audience and without aid or instruction. The information imparted in Helen's essay would have been wonderful and prodigious for a child of her age who had never been afflicted and had received the best possible teaching. She did not make a mistake in a single instance, and when it is considered that her information on entomology all had to come from lessons imparted by touch alone, that she could not hear the bird song nor see the butterfly, that she could not watch the chrysalis nor study the insect, is not a well written and accurate essay phenomenal? She is most remarkable for her mathematical genius, which is absolutely startling in the rapidity with which she gives results and the accuracy of those results. Her diction is simply marvelous. It is pure, lofty, expressive. In the grammatical construction of her sentences she never errs. Nothing jars on her more than inaccuracies of speech or the use of slang. Invariably does she correct such errors and improve such habits. She now uses a vocabulary of some 4,500 words and does not err in the use of one. About one year ago Helen began to mutter a few words that could hardly be called speech. The lesson was taught by her placing her hand on the throat of the speaker and a low and distinct tone the words were spoken slowly. After a few trials Helen could utter the words so they could be understood, but could not talk. Last spring Miss Sarah Fuller, principal of the Horace Mann School for Deaf Mutes in Boston, became more than ever interested and instructed her two or three months. On her return trip home from Boston she stopped to visit a gentleman friend who has long been much interested, and who is now more than ever concerned in her case. While she was engaged with the gentleman a Presbyterian minister entered into conversation with Miss Sullivan regarding Helen. Among other questions asked was one to know if her parents were Christians. He was answered that they were of the Presbyterian faith. He then wanted to know if Helen had been taught the tenets of the church and was informed that an agreement was made to the effect that Helen should be allowed to form her own conclusions on christianity. This was agreed to by her parents and a number of scientists who are friends of the family. This agreement was made in the interest of theology and to see if there was such a thing as total depravity where intellect was possessed; if christianity was a lesson or inspiration. When the preacher engaged Helen in conversation he asked her if she prayed, and she answered in the affirmative. He then asked her what she prayed for, and she quoted from her favorite poet, Whittier:

"I pray to God to make me beautiful within
And mine eyes to behold all good save in sin."

On Helen's return home she found one branch of the family in deep distress over the death of a member. She offered consolation in such a spirit of truth and virtue, such an absence of guile and lofty thought, that man had not yet scaled to the summit of her inspired views. The question of total depravity was destroyed, and no one to hear her can doubt that she possesses some supernatural power. She had written many letters home and frequently told her parents that she had a great surprise in store for them, but would not tell what it was until her return. They found that she could speak many words quite plainly and is daily adding more to her vocabulary of speech. When she pronounces a word she never forgets it. She formerly spoke words by putting her fingers on the throat of the speaker. A few days ago she was seen sitting on the floor with her three-year-old sister and her fingers touching the lips of the child as it talked to her. Her face wore a look surpassingly interesting and attentive. There sat a child that could not see, that could not hear, who was engaged in conversation with her baby sister through the one sense of touch. When the little one would talk Helen would pay the closest attention and would then reply or ask questions. It was strange and startling. Miss Sullivan says she never knew of this being done before. Just think of the one sense of touch being educated to such exquisite perfection that the fingers become a receiving board and transmit to the mind of the operator the delicate vibrations of the lip caused by the quivering of sound on human flesh and the movement made by speech. Here is indeed a study for science. Here is Edison surpassed. All who see the child are more and more surprised. No one can comprehend the truth. No one can grasp the marvelous wonder without seeing the child. Monday last Colonel Keller bought a type-writer and sent it out to his summer home on Mount Pleasant to Helen. Miss Sullivan began to instruct her how to operate it, and in half an honr after touching it she began and rapidly wrote the following with errors as here:

MOUNT PLEASANT, Aug. 11, 1890.— MY DEAR FATHER: My type-writer came this morning & I am going tō try to write you a letter on it. I thank you for it. I hope I shall learn to write rapidly before long. It is beautifully & cool up here on the mountain, & we are all very, very happy. I shall be so glad twhen you come. We all went down to the train this morning to welcome Simpson. From your loving little daughter with many sweet kisses & a hug O HELEN A. KELLER.

There is one thing more marvelous than all else. Helen, when introduced to any one will put her hand on the face of the party and then not meet the party for years, but when they do meet the little girl will put her hand on the face of the party, tell the name, the place of former meeting and the circumstances attending the meeting. This has been done hundreds of times when others had forgotten the person having met Helen, and she would have to tell them of the meeting and attending incidents. They receive hundreds of letters from different people wanting a description of Helen, while many others want a photograph. Colonel Keller has heretefore not consented nor objected to accounts being published. This was submitted to him and hence is accurate in each statement. He is very proud of the child and does all that position, love and wealth can confer. She is supremely happy and her life is as free from thought of sin as an infant. She is an unanswerable illustration of mute christianity and is never heard to speak an angry word. The life of this child is like a beautiful poem, true to nature.

FILTERED WATER.

HOW TO AVOID THE RISKS OF IMPURE ICE.

Of late attention has been directed to the latent dangers of ice. It has been found that this apparently harmless and attractive substance may fairly reek with disease germs and filth of all kinds. Unless it is known from whence the ice comes, the use may be more dangerous than the use of water. Ice is sometimes derived from water which no one would think of drinking, as, for instance, from ponds and rivers in the neighborhood of sewer outlets, and, as a result, may be indescribably foul. Aside from the danger of germs lurking in ice, there is risk in the indiscreet use of water cooled to an abnormally low temperature, since functional disorders are often caused by the drinking of very cold water. No water is so refreshing as that of a mountain spring, and one reason of this is that its temperature is just right. It is well to take hints that are given by nature, and the hint that the best temperature of drinking water is about 50 deg. Fahr. is a good one, and worth following. I would suggest—and I am sure that every one who tries it will be more than satisfied—that the filtered water be caught in stoppered carafes, or, what is just as good, carefully cleaned sherry bottles stoppered with new, clean corks, and that those bottles filled with water and carefully stoppered be placed in the refrigerator for several hours. By putting half a dozen such bottles filled with water in the refrigerator and replacing them with others as they are taken out,

a supply of clean, filtered water of a satisfactory and safe degree of coolness may be kept continually on hand. The use of this simple method of purification of water will, I am certain, prevent many a case of sickness and not a few deaths, and it is so simple, cheap and efficacious that any one can make a success of it.—*English Mechanic.*

LONDON'S WATER SUPPLY.

REMARKABLE RECORD OF A COMPANY'S GROWTH IN VALUE.

"From time to time one sees in English newspapers an announcement to the effect that the fractional part of an 'Adventurer's Share' or a 'King's Share,' as the case may be, in the New River Company has been put up at auction and sold for a sum which, without exaggeration, may be considered a handsome fortune," remarks *Chambers' Journal*, and adds: "Comparatively few persons perhaps know of the origin of these peculiar classes of shares, and a short sketch of their history may therefore prove of interest. The New River Company, the first and most successful company of its kind, was founded nearly three centuries ago by a Mr. Hugh Middleton, a City man of some wealth and repute. During the reigns of Elizabeth and James various schemes seem to have been projected for supplying the London metropolis with water, but it was not until the year 1609 that anything decisive was done in the matter, when at the invitation of Mr. Middleton, the Court of Common Council transferred the powers they had obtained from Parliament to that gentleman, who at once began what was at that time considered a gigantic work. The object in view was to connect certain springs at Chadwell and Amwell, in Hertfordshire, with the metropolis—a distance of some twenty miles; but, owing to the many hills and valleys, nearly double that distance had to be taken for the course. Up to the time of the date of the company's charter—the year 1619—the work is said to have cost upward of half a million of money, and until the year 1633 no dividend appears to have been paid on the shares. In fact, so unpromising was the aspect at that period of the company's affairs that Charles I. regranted to the heirs of Sir Hugh the whole of the thirty-six shares possessed by the Crown on condition that a yearly rent of £500 was paid to the Crown. Thus it will be seen how the general public became possessed of these shares. It may be of interest to note here that the holder of a King's share is excluded from having any part in the management of the concern, its founder, in order to prevent the direction of its affairs from falling into the hands of courtiers, having stipulated with King James that his Majesty should take no part in the management. Thus these shares are slightly less valuable than those of the 'Adventurers,' which give the holders a seat on the directions. Both classes of shares have by alienation become divided into fractional parts, which, in regard to the Adventurers' shares, necessitated an application being made, in the year 1711, to the Lord Chancellor to determine how the holders of these fractional shares were to be represented on the board. The problem was solved by a decree to the effect that the possessors of two or more fractional parts of a share were empowered to jointly nominate one of their number for election to the board. To give an idea of the enormous value to which these shares have risen, it may be stated that in the year 1800 one was sold for £14,000; in 1811 the price obtained was £17,000; in 1878, £93,000, and at the close of last year the eighth part of a share sold for a sum at the enormous rate of £100,000 per share, an amount which in years to come is not unlikely to be exceeded, owing to the reversions of a large property which will accrue to the company, and so still further enhance the value of these historical securities."

PAINTED METAL.—To make paint stick to bright metal tin roofs, sand-paper the metal.

PURE FOOD.

WHERE THE RESPONSIBILITY FOR SOPHISTICATION SHOULD REST.

The adulteration of our foods is one of wrongs against the pocket-book rather than against health. Of debased food—that is, food below standard—there are large quantities sold, as the analyses of chemists too often testify; but in the present state of our knowledge it would be very difficult to justify criminal legislation against the purveyors of this adulterated food as dangerous to the public health. This is the stumbling block which seems to have been in the way of the passage of food laws by Congress or in the several States. All are agreed as to the wisdom of police laws against such conditions as may spread disease; but all are not convinced that Government should attempt the task of prevention against commercial frauds in food further than is now done by general laws. Pure spices, for example, are said to be frequently mixed with an inferior bark or other substances, and sold. There has not yet been traced to this debasing of spices any deterioration in bodily health which would be accepted as evidence before any court of law. The result of the adulteration is simply that the strength of the spice is reduced. If now the price is likewise reduced in proportion, the fraud is against good morals and common honesty. Of course, there is a large chance for fraud in such a state of things—a chance often availed of, for an unscrupulous dealer can get a price for a package of spices out of all proportion to the value of the contents. The case is further complicated by the well-known propensity of very many people to buy their spice where it can be got the cheapest, quality being too often a minor consideration. Cotton-seed oil is another illustration. A man may not like it for himself, but he cannot say that lard or olive oil adulterated with it is unwholesome, for the contrary is the fact. Indeed, it is confidently affirmed that lard mixed with cotton-seed oil is not only cheaper, but, for certain uses, is really just as good as the pure article. Certainly we cannot prevent such mixtures on any ground of public health. The question, then, is one of sophistication—that is, a moral injury to the public, rather than of adulteration, a danger to health—a distinction in terms which some food experts are trying to introduce. A carefully drawn law defining debasement of food has been several times introduced into Congress, but was not passed, on the supposition that public opinion was not ready for it. Some few States have enacted similar laws, New Jersey being one. Such laws allow mixtures, provided the fact of such mixture is plainly stated on the package; otherwise the article is legally construed to be adulterated. A recent addition to this New Jersey law releases the retailer from responsibility for the sophistication of food offered for sale if he can show a warranty from the manufacturer or jobber. This is manifestly just to the retail grocer, who is not an expert, and who should be acquitted of any wrong if he has taken every reasonable precaution. Meanwhile the consumer, if he wants cheapness at the expense of quality, or if he wishes a pure article and is willing to pay the price for it, can be supplied. Such a law has been in force in England for several years, and has done great good. The English markets are open to the world, and hence are liable in an unusual degree to every form of skilful adulteration which foreign growers and dealers can invent. Even "coffee," carefully made from burnt beans, is sent there from Germany. This warranty law throws more responsibility and expense upon the English importers than upon other traders, but matters in the long run adjust themselves. So, too, in Paris, as is well known, the rules against adulterated articles, such as wine, in the city shops, are very strict, and no merchant can tell when his stock may be subject to a rigid inspection. In their practical workings such laws as the English against debasement of food would afford little protection, were they not supplemented by arrangements for public analyses of suspected articles. Butter can be taken to the Government chemist at any time, and paid inspectors visit the shops. If a package of spice afterwards found to be adulterated is sold to the inspector without some notice of what it really is, the shopkeeper is brought before the magistrate. If he can produce a warranty covering that particular package, the prosecutor turns to the London house. Possibly the London merchants bought the spice from Ceylon without examination. If so, they must pay a fine for their carelessness. Sometimes hard legal battles occur over the question whether the spices are really adulterated or not, and occasionally the inspectors and chemists are beaten. While, therefore, if we are to have food laws, such a warranty as the New Jersey law contains is equitable, practically the whole legislation must fail of effect without a further system for the detection of dealers and their products which violate the law. The appropriations of the State of New York for chemical work upon foods are entirely inadequate for any such result. To please our dairymen, a commissioner and assistants hunt up cases of sales of oleomargarine assiduously. Margarine is only one of many things in which consumers of food are interested. If we see our way clear to Government regulation of our food supply at all, such regulation should be accompanied by appropriations for analysis and inspection, through which alone regulation can have any practical effect. Then a system of warranting the purity of food products sold at retail would help to find the real offenders.—*N. Y. Evening Post.*

A TELEPHONE BREATH.—Mistress—Bridget, the telephone is ringing, and I wish you would answer it. Bridget—An' me afthur atin' onions fur me dinner. Sure, Oi'll do nothin' of the sort, for who knows but fwhat it bees the young man as delivers the groceries.

OUTSIDE HEATING.—A new departure has been taken in the plans for the new building for the Congressional Library in that the whole of that immense structure will contain no fire. The building will, of course, be heated, but the heat will be located outside the building. Vaults will be constructed in the grounds, where the fires and boilers will be placed, and the hot air will be carried into the library building by means of pipes. By this means complete protection against fire is secured.

HOT WEATHER ADVICE.—One must be very careful of his diet with the thermometer at 100 deg. The less meat he eats and the less strong liquor he drinks the better, and the less iced water, too. It does seem curious, but experience has proved it to be true, that in hot weather the stomach should be kept hot. In India, as is well known, the people eat their food so hot with red pepper that to us it would seem as though that was the staple in the dietary way. And they always wear a band of flannel across the stomach. If we would follow their example, it would be better for us.

LITERARY NOTE—"At the Dawning" is the title of a new American novel by a new American novelist, to be published September 1st by the Keystone Publishing Co., of Philadelphia. This will be the initial number of the new series of American novels to be issued by this Company, and is said to excel in strong character-drawing. The central figure is a modern society man, whose real character is subjected to a merciless dissection. One critic has said on this point: "Many a society favorite will wince under the stinging lash that flays Sidney Carothers,' for there are thousands of his ilk who will see in this character a wondrous likeness."

SUGAR CHEMISTS.—The extract below is from *St. Christopher (La.) Gazette*: "We have long thought that the government could not have given more direct and practical assistance toward the development of our material resources than by establishing in our midst a qualified analytical chemist. The growth of the sugar cane and the manufacture of sugar is, and must long be, our staple industry. Elsewhere—notably in Barbadoes—the science of chemistry applied to agriculture and the manufacture of sugar has resulted in the advancement, by leaps and bounds, of commerce and the general well-being. Why should it not have the same effects here? We gather from those well qualified to judge that the loss occasioned by the ignorance on the part of our planters of the most elementary facts of chemical science is simply incalculable."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

September.

Game and Poultry.—Pigeon, chicken, duck, woodcock.

Meats.—Beef, mutton, lamb, veal, ham, kidneys, liver, venison.

Fruits.—Apples, bananas, blackberries, gooseberries, huckleberries, grapes, melons, oranges, peaches, pears, pineapples, plums, raspberries, currants.

Fish.—Bass, blackfish, bluefish, clams, cod, crabs, eels, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, rockfish, salmon, trout, sea bass, sturgeon, turtle, white fish, whiting.

Vegetables.—Beets, beans, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips.

PRACTICAL RECIPES.

Stewed Cold Potatoes.—Cut three or four cold boiled potatoes into dice and stew them slowly in cold milk until the milk looks thick and creamy. Mince fine one tablespoonful of fresh parsley; add it to the potatoes, with one-half tablespoonful of butter, and salt and pepper. Serve very hot.

Baked Tomatoes and Potatoes.—Cover the bottom of a baking dish with cold mashed potatoes. Cut three large fine tomatoes in half; place them on top of the potatoes, with a large lump of butter on each slice, and pepper and salt to taste; cover with another layer of potatoes, and bake a fine brown.

Stewed Raisins on Toast.—Cut some thin slices of bread into neat little pieces two or three inches square and fry them brown in butter and set them aside on a warm dish. Stew for a few minutes some fine stoned raisins in sweet wine, with a little sugar added. Pour them upon the toast, and serve as a supper dish.

Lobster Croquettes.—Remove all the meat from a lobster and pound it fine; add to it one tablespoonful of vinegar, one cupful of mashed potatoes, two teaspoonfuls of mixed mustard, pepper and salt. Mix together thoroughly and add a well-beaten egg; form into croquettes and fry in boiling lard. Dish daintily, with a garnishing of sliced lemon.

Fig Cake.—One cupful of sugar, one egg, and yolks of three, two-thirds of a cup of sweet milk, two cupfuls of flour, with which two teaspoonfuls of baking powder have been sifted, three tablespoonfuls of butter, bake in jelly cake tins. Filling: One-fourth pound of figs, chopped fine; boil two-thirds of a cup of sugar, one-third cup of water ten minutes and cool. Add figs and whites of three eggs; spread on the cake layers; put together and ice.

Lima Bean Soup.—Take one pound of fresh beef or veal, or the bones and trimmings of any left over cold meat, and put it over the fire to boil, with one-half pound of salt pork, a bunch of parsley, an onion, half a turnip, a small carrot, a few stalks of celery and three pints of cold water. If you have any gravy, this also may be added. Boil slowly for three hours; strain; skim off the fat; remove the meat and vegetables; add one pint of beans that have been parboiled. Boil slowly until the beans break; mash through a colander; season to taste and serve with snippets of fried bread. Dried beans may be used if the fresh ones cannot be had.

Feather Cake.—One cupful of sugar, one egg, one-half cup of sweet milk, one tablespoonful of melted butter, one teaspoonful of baking powder, one and a half cupfuls of sifted flour. Flavor with some of the grated rind and a little of the juice of a lemon or with vanilla.

CELLULOID.

THE FRENCH PROCESS OF MANUFACTURE.

The manner in which celluloid is made in France is as follows: A huge roll of paper is unwound slowly, and while unwinding is saturated with a mixture of five parts of sulphuric and two parts of nitric acid, which is carefully sprayed upon the paper. The effect of this bath is to change the cellulose in the paper into pyroxyline. The next process is the expelling of the excess of acid in the paper by pressure and its washing with plenty of water. It is then reduced to a pulp and bleached, after which it is strained and then mixed with from twenty to forty per cent. of its weight in water. Then follows an other mixing and grinding, after which the pulp is spreadin thin sheets, which are put under enormous hydraulic pressure and squeezed until it is as dry as tinder. These sheets are then put between heated rollers and come out in qulte elastic strips which are worked up into the various forms in which celluloid is made.

MEDICINAL HONEY.

THERAPEUTIC QUALITIES OF HONEY FROM THE EUCALYPTUS TREE.

Some English physicians appear to adopt in their practice the honey found in such large quantities in the eucalyptus trees of Tasmania, the product of a small, black wild bee peculiar to that country. The honey is a thick, homogeneous, somewhat transparent, sirupy liquid, of a deep orange color, having an odor suggestive at once of its containing eucalyptus principles, is very soluble in water, in milk, and in wine, but much less so in alcohol, and very difficult of fermentation. In round numbers, 1,000 parts contain 611 of invert sugar, 2 of ash, 215 of water, and 171 of active principles, including eucalyptol, eucalyptene, terpine, eymal, and odorous, resinous, and coloring matters; it tastes very pleasant. On taking a tablespoonful of the honey in a little tepid water or milk, after a few minutes one perceives a gentle, agreeable warmth taking possession of the whole person; at the end of half an hour, the elimination of the active principles by the air passages have begun, the voice becomes clearer and the breath perfumed, the lungs also feeling more active, more supple. Thus far, experiments show it to be a valuable aliment, an efficient and palatable substitute for cod liver oil, an anti-catarrhal, an agent affecting the heart in a manner comparable to the action but free from the inconvenient properties of digitalis, a febrifuge, and an antiparasitic in tubercular and scrofulous ailments.

CHAMPAGNE.

A CALIFORNIA BRAND EQUAL TO THE BEST IMPORTED.

Champagne is defined by Webster as a kind of brisk, sparkling wine, and as it has always been made in France, the public naturally considers that champagne can only come from the champagne district in France. To give our readers a correct idea of the matter, we will first describe what genuine French champagne is, and how it is grown and made. Then we will be better able to explain the difference between this and genuine American champagne, and prove conclusively that an unprejudiced American can find good, pure champagne in his own country without paying double price for foreign, much of which is trash. Much popular misapprehension exists about champagne. Newspaper writers and sensational statisticians have, from time to time, informed us that the whole champagne country does not produce sufficient of this wine to supply home consumption. It would take more space than we have at our command to enumerate all the stories which have been published about this popular wine, so we will proceed at once to give a few facts concerning it. Before describing the country where it grows and the manner of its manufacture—for it is a manufactured wine—we must state a few positive points. Champagne is used but sparingly where it grows. It is too dear, and can be sold to better advantage, and like the Italian olive growers, who sell all their olive oil and use cotton-seed oil, the French vine grower sells all his champagne and prefers the cheaper "vin ordinaires." While champagne does not grow as champagne, the wine of which it is manufactured must be of superior quality, and though this crude wine may not be pleasant to drink as it is, it alone makes good champagne. Only the juice expressed from picked grapes, carefully cleaned of all stems and leaves, can be used. Time is required to manufacture wine. The necessary manipulation requires great dexterity, only acquired by long experience. The breakage and consequent waste of the wine in process of manufacture is enormous, often reaching 15 to 20 per cent. The liqueur employed in its manufacture is a great secret with most manufacturers. The United States are willing to pay for and actually get the choicest wines. The taste for dry and sweet wines is constantly changing, and so the manufacturer must change his processes. Of late years the demand of the American market has been for dry wines. A reaction for sweeter wines set in, which is now being displaced again by a demand for drier wines. England has always taken an older, drier and less effervescing wine than this country, and the frequency of Americans visiting England has caused a tendency to imitate the English taste. It may be here explained that the word "sec" simply means dry or tart. With these preliminary statements we will now proceed to a more specific statement of the manner of growing, harvesting, pressing, fermenting, bottling and manipulating champagnes. Genuine champagne wine is harvested only in that part of the Department of Marne which is situated in the vicinity of Epernay and Rheims. The vineyards which produce the finest grapes have a surface of about 40,000 acres, from which 7,000,000 gallons of wine for champagne are made annually, and to those vineyards a special and extremely careful cultivation is given. This wine, which is exported to all parts of the world, and whose reputation is universal, owes its fineness of taste, freshness and the particular bouquet which characterize it and distinguish it from all the other wines to the peculiar quality of the earth, to the manner of cultivation observed in Champagne, and to the liqueur used. One-fourth part of the vineyards are planted with white grapes and the other three-quarters with black grapes. They are both used to make the white wine, as the juice of the black grapes is separated from stems and skins, which alone give the red color when fermented with the juice. Notwithstanding, in good seasons when the grapes have attained to an early maturity, the wine thereof is of a pale reddish tint, which is a sign then of the very best quality. The wine made of black grapes has more body, alcohol and bouquet than that made of white grapes; but, in return, this latter has more fineness and is more saccharine, hence gives more carbonic acid gas. The principal places where black grapes are cultivated are: Ay, Mareuil, Champillon, Hautevillier, Dizy, Epernay, Pierry, Cumency and Avenay—these on the hills skirting the river Marne—and Bouzy, Verzenay, Sillery, Mailly, and Rilly, in the Rheims Mountains. Those of the white grapes are: Cramant, Avize, LeMesnil, Oger, Groves and Cuis, situated south of Epernay. The principal operations necessary to make the effervescent champagne are these: The grapes are harvested and cut with great care, then as-

sorted, picked from the stems, and the daily gatherings are immediately pressed. The three first runs from the press give the choice wine (la cuvée), the fourth run gives the vin de taille, or is immediately used for wine of inferior quality, and the rest of the juice serves to make the wine destined for the operatives. Coming out of the press, the wine is put into casks, where it begins to ferment in a few hours, and this fermentation ceases only in the time of the first frosts. Then it is changed into fresh packages, clear from the lees which are on the bottom of the casks, and the "recoupage" is performed, which consists of mixing together, in tuns of large capacity, the wines of different places, and especially the wine of white grapes with that of black grapes. The choice is given to those which blend best, of which the bouquet and the color agree best, and which improve and adapt themselves best to each other. This mixture takes the name of "cuvée," and they are numbered in regular order, or are given the name of the place from which the largest part of the wine they contain is brought. As in the same vineyard, under the same name, one can have different qualities depending on the exposure of the particular part of the vineyard to the sun, on the more or less care in the cultivation and in the vintage; differing most as to the season, the champagne produced in such ways is graded as to place of growth into superior, middling, and ordinary, it is easy to see the cause of the difference in value and market price. The wine is put in bottles in the warm season, beginning in May. The bottles, first being carefully washed, are filled and stopped with special machines and the stopper fixed with iron wire. The bottles are then laid down and piled on wooden slats. After two or three weeks, according to temperature, the effervescence begins to develop in the bottles. When this effervescence is sufficiently strong, and several bottles begin to break, they are transferred to very cold subterranean cellars, where they must be stored at least two or three years before reaching their maturity sufficiently for shipment. The wine of the current year can be bottled, but generally it is mixed with those of former years, held back for this purpose, especially when possessed of very good qualities. When a cuvée has been stored in the cellars the time necessary for acquiring all its necessary qualities, the bottles are reversed, the neck downward, upon perforated tables, and during three to four months every bottle must be shaken daily, giving it a peculiar, rapid jarring motion to make the sediment formed during the development of the effervescence precipitate. This work is terminated only when the sediment is entirely deposited on the cork. In consequence of the development of the saccharine fermentation, the natural juice of the wine is transformed partly into alcohol and partly into carbonic acid gas. In this state the best wine is not to most people agreeable to drink, and it is necessary to add sugared liqueur made of pure rock candy dissolved in old reserved wine of first choice, to restore to the wine the sugar that has been lost by the development of the carbonic acid gas. This is done this way: After the sediment has been precipitated and lies fast down on the cork, the bottle, always kept in the inverted position, cork downward, is taken by a skilled workman in the left hand, while he takes off the wire or string. The cork, drawn by a pair of pincers and pushed by the effervescence, comes out of the bottle, throwing out with it the sediment. The space occupied by this sediment is filled with the sugared liqueur by a special machine, which allows modifying the quantity of liqueur to be added according to the market where the wine is destined to go, and allows the wines to be made more or less tart (dry, "sec," or sweet, "doux"), depending on the taste of the consumers. The bottle is immediately stopped again with a new cork already marked with the brand of the firm, and corded and wired. All French wine makers add brandy or spirits to the liqueur to fortify the wine, but with fine champagne this should not be the case. There remains then only the packing. The bottles are furnished with labels, with foil caps, sealing wax or capsules, enveloped with paper, and put in cases or baskets. The bottles are manufactured on the ground especially for these wines. The corks are the best Spanish. There are many brands of champagne imported, one wine trade journal alone giving a list of thirty-six brands. Some importers bring two or three kinds of champagne to this market under different labels, and sometimes of different character, such terms as dry, extra dry, sec, and dry extra being used to distinguish them. The importation of champagnes varies from one hundred and fifty thousand to three hundred thousand cases per year, and the relative demand for the different brands is also subject to great fluctuation, depending largely upon the varying taste of wine drinkers and the public, but more largely upon the amount of money spent by the importer in introducing his particular brand to the public. In this connection it may be truthfully said that the cheaper and poorer the champagne the more money the importer can afford to spend in pushing his wine, so that frequently the poorest wine enjoys the largest sale. It is said that one champagne salesman in New York is allowed one thousand dollars a month for "expenses," besides a large salary. Various tricks are resorted to in order to keep a brand, which perhaps possesses no merit whatever, prominently before the public. Barkeepers are bribed openly, a premium is paid on corks. Even titled drummers are employed to assume the character of gentlemen, and in that guise attempt to set the fashion of calling for certain brands. Champagne drinking is largely a matter of fancy, and our American people are more or less influenced by the preferences of the English people, and so we find the spectacle repeated every fall that as Americans return from Europe one brand of champagne, which may have been a favorite the preceding year, is discarded for some other brand, which has become better known to them in Europe. Then again there are some brands the sales of which are almost exclusively confined to saloons and other places of resort, of even more questionable respectability, but such brands are generally the cheapest and poorest. Other brands, again, and these are the best and highest priced, are not so often found in saloons, but are more frequently used at the private tables of those who really know a good champagne. The prices of French champagnes, according to a late price current, vary from twenty-six dollars per case to thirty-four dollars. The majority of these champagne houses own no vineyards, but buy the couvée from vineyard owners, and sometimes even buy the finished wine in bottles, to which they affix their labels and caps. These champagne makers have stations at different points in the champagne districts for the reception of the grapes and the first extraction of the wine. The grapes are received from hundreds of villages and hamlets. Many manipulators are necessary to prepare the wine for shipment. The quality of champagne depends upon two conditions, which are the secret of the trade—the mixing of the different vintages to obtain a uniform wine, and the sweetening materials (liqueur), which impart to it its special character. Having thus given a very full account of the methods pursued with French champagnes, we can say something about our American product.

The reader must be careful not to confound true American champagne with the miserable compounds of tartaric acid, glucose and alcohol, charged with carbonic acid gas, and miscalled American champagnes. The genuine American champagne, so far as we know, is only made by three firms in this country—one in New York State, one in Missouri, and one in California. The latter we will describe, as a fair sample of pure American champagne. It is known under the brand of Eclipse, and made by Arpad Haraszthy & Co., of San Francisco, California. The head of the firm, after completing his education in Paris went to the champagne country and there learned practically the art of manufacturing champagne in all its details. Shortly after returning to California in 1862 he began operations towards the production of a pure sparkling wine. The experimental stage covered several years before it was found possible to produce a sparkling wine, uniform in quality and in sparkle. With this knowledge, which necessarily must be of the most practical, as well as the technical climate and variety of soil such as California alone possesses, and phylloxera resistant vines, it is absurd to believe that, with an honest purpose, as good champagne cannot be produced in San Francisco as in Rheims, Ay and Epernay.

What has been already described as the methods of making champagne applies equally well to that of the Messrs. Haraszthys, with these differences only, that more care is used in selecting grapes and making the cuvée and that absolutely nothing but the purest rock candy, dissolved in the choicest of old white wines, is used for the syrup. The vineyards from which these wines come are situated in no less than five different counties in California. The warehouse and cellars of Messrs. Haraszthy & Co. are very extensive, covering over 120,000 square feet, and there are constantly in process of ripening over 600,000 bottles, besides enormous stocks of still wines of the higher grades produced in the Golden State. The business is conducted with so much system and exactness that an inspection of the corks or labels will enable the proprietors to tell at once just what blend or lot the particular bottling is taken from. English and other European experts and wine merchants have, within the last two months, compared the quality of this champagne with the most reputed brands of France, and have pronounced it their equal in all respects, a fact that should make every public spirited American proud of the product. Besides this, there is a good advantage in the fact that it can be obtained from the various agents in the large cities, at the low figure of $17.00 per case of 24 pint bottles, or $14.50 per case of 12 quart bottles.

The agencies of the firm are situated at the following places:

London, Grierson, Oldham & Co., 11 Regent Street, New York, Park & Tilford, 917 Broadway; Philadelphia, F. P. Dilley & Co., 25 N. 10th Street; Chicago, C. Jevne & Co., 110 Madison Street; St. Paul, C. Jevne & Co., 114 E. Third Street; Detroit, G. & R. McMillan & Co., 131 Woodward Avenue; Cincinnati, Joseph R. Peebles' Sons Co., 73 W. Fourth Street; Kansas City, Martin, Perrin & Co., 300 W. Sixth Street; New Orleans, F. Holland & Co., 51 Custom House Street; Honolulu, H. I. Henry Congdon & Co.

Messrs. Haraszthy & Co. are owners of the Orleans vineyard in the Foot Hills of Yolo Co., planted with the choicest European varieties of vine grapes now approaching 400 acres, and besides producing the Eclipse champagnes, they also make large quantities of the best and purest of still wines, none of which are sold under French labels but only under the well-known label of the firm, which is always a guarantee that the contents are just what they are represented to be, in quality as well as in age. Such wine makers, though they may still have some up-hill work in competing with unscrupulous sophisticators are sure of success in the end and well deserve that success.

TO SEDENTARY PEOPLE.

As sedentary pursuits are nearly all conducted within-doors, there is apt to be an insufficiency of fresh air, sunlight and agreeable surroundings; and, naturally, the muscles and sinews being put to little use, grow weaker, and weaken the surrounding tissues. The blood circulates with smaller activity, and the heart and lungs, having less work to perform, lose their tone and full power. The oxygen supplied through the respiratory apparatus being diminished in quantity, the blood is no longer kept pure, and humors are generated and accumulated. Finally there is a break down, and sickness of some sort occurs. Before the appearance of an actual ailment it is easy to note the progress of the tendencies which give it birth. The color of health fades from the cheek and is replaced by the yellow,

brown or gray tints which indicate choleic or uremic substances in the blood, and, beyond these, impaired or weakened liver and kidneys. Dark circles form around the eyes, which are said to sink, and actually do sink, in their sockets. This shows an insufficient supply of blood and a heart and lungs that are no longer doing their full duty. Eruptions occur upon the skin. It may be in the form of pimples or rashes upon the face; of eczema upon the arms, legs and chest; of prickly heat and hives upon the body. Each and all of these point out impurities in the blood, and demonstrate that Nature, unable to remove or destroy them in the normal manner, is endeavoring to expel them through the pores and glands. Headache, diarrhœa, biliousness, loss of appetite, want of memory, general debility and weak back are other symptoms of equal import and significance. These evils, though extremely common, are not unavoidable. They can be easily prevented and easily cured. A little common sense will teach what is to be done in the premises. First, get as much sunlight and fresh air as possible. Don't be afraid of drafts and chilly breezes. Keep the skin hard and clean with cold water and you will take no cold. Second, exercise regularly every day. Walk as often as you can, and do not allow indolence to prevail in favor of the horse-car where the distance to be traversed is small. Indian clubs and dumb-bells are unnecessary. Anything which calls the muscles, the heart and lungs into play is sufficient. Third, keep the blood pure. This is all-important. Without it there is neither help nor health. Do it by using Ayer's Sarsaparilla, which is the only true blood-purifier known in medical science. It contains the extracts of sarsaparilla, yellow dock, combined with other well-known tonics and alteratives, which cleanse the blood, invigorate the vital functions and strengthen and build up the tissues. Taken in time, it undoes all the evil effects of a sedentary calling, and so prevents the suffering, sickness and too often death which follow a disregard of the symptoms mentioned. To women who work in these callings, Ayer's Sarsaparilla is simply invaluable. It preserves their strength and buoyancy, and, above all, it prevents that premature aging and decay which so characterize the working-woman of to-day.

PERMANENT PRESERVATION.—A Belgian chemist has discovered a means for rendering texture, no matter how delicate in fabric or color, proof against the ravages of decay. The wonderful state of preservation which the head-bands of Egyptian mummies exhibit is due to their having been impregnated with a kind of resin. This led the inventor to make certain experiments with the substance extracted from birch bark, to which the peculiar aroma of Russian leather is due, and he found that the green tar, which was left over after the oil used in tanning had been extracted from the white bark of the birch tree, yields neither acid nor alkaloid, and that in solution with alcohol it forms a liquid of remarkable fluidity, with the power of resisting, when once dried, even the action of alcohol.

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CONTENTS.

THOSE ENGLISH SYNDICATES.

Considerable interest has been aroused by the publication of several sales of breweries, flouring mills, cotton factories and other large enterprises to English capitalists. The true inwardness of these deals has not been generally understood, and a little light thrown thereon may prevent some people who are not on the inside from losing their money. In this country there are two or three law firms and one or two brokers who, in connection with a guarantee company in London, have engineered these sales, to the profit, as we believe, of these lawyers, brokers, guarantee company and perhaps the sellers, but to the ultimate loss of the final purchasers—the dear, gullible public both in England and the United States. We will, therefore, briefly describe the *modus operandi.* A party here, for instance, has a brewery which he is willing to sell for one million dollars cash, and on which he can show a profit for three years back of one hundred and fifty thousand dollars a year, or fifteen per cent., on a million of dollars. A plant of this kind comes within the rules under which the English guarantee company will buy. After having the books thoroughly examined by expert English accountants, and finding the seller's statement corroborated, bonds to the amount of one million and a half of dollars are issued, on which the guarantee company will advance one million of dollars and give an interest guarantee for three years. Common stock for a similar and sometimes for double the amount is issued, but carefully bought up at about seventy cents on the dollar by the promoters, who hold it out of the market for a purpose to be presently explained. With the million of dollars cash obtained from the English guarantee company the brewer is paid the purchase money. A contract is then made by which the brewer, who had heretofore received only his profits, now in lieu thereof receives a salary of, say, ten thousand dollars a year, and two boards of directors, one in England and one in this country, are selected, among whom some twenty-five thousand dollars a year in fees for attending meetings are distributed. They must be paid for lending their names to the scheme and doing the deportment. It will be seen then that the expenses have been increased some fifty thousand dollars, while the capital has been increased from one million to three millions or more. Other expenses of numerous officers and clerks are also added, so that the original fifteen per cent. profit on one million of dollars has dwindled down to less than five per cent. The earning capacity of the plant could not increase. The first and second year dividends of twenty to twenty-five per cent. are declared; but as the stock is all in the hands of friends, need not be paid, as indeed it could not be, there not being that much earned. By declaring such dividends the market value of the stock rises to from one hundred and fifty to two hundred dollars per share on a face value of only one hundred dollars. Then the stock is unloaded upon innocent holders, who will find that the earning capacity has suddenly fallen, so that only three or four per cent. dividend are declared the third year, which the guarantee company can well afford to pay. After this, the guarantee having ended, no further dividends will be forthcoming. The result is that the original seller, if he was sharp enough, received his price; and while the promoters and guarantee company divide the large profits of the transaction, the investor is left with a lot of almost worthless paper. Comment is superfluous.

STOCKYARD AND DRESSED BEEF SCHEMES.

The daily papers contain accounts of two large enterprises in the line of new stockyards and beef dressing. One, the Interstate Stockyard Company, with one million dollars capital, has just been incorporated in New Jersey. Nelson Morris, of Chicago, is at the head of this concern, and they propose building abbatoirs in New Jersey for the production of export beef, and at various points on the Pacific coast, to supply that section with dressed beef. From the latter points the company may also try to make new markets in the Pacific islands. The Pacific coast abbatoirs will, no doubt, be a success; but it is a puzzling question how the dressing of beef in New Jersey, having to bring the live stock through or at least as far as from Chicago, can be made to profitably compete with dressed beef brought from Chicago, Kansas City or other western points. The other company is to be called the Dahlman Dressed Beef Company, and intends to dress its beef in Texas and bring it by sea and rail to Europe. With the lamentable failure of the Marquis de Mores in a similar enterprise before our eyes, and the fact that so far not a practical or experienced man has been named in connection with it, there is considerable doubt as to the ultimate success of the company, if it ever was intended to be anything more than a stock jobbing enterprise gotten up only to sell out. The papers are making fun of it, saying that it will be a great competitor of the "big four." We do not believe that Messrs. Armour, Swift, Hammond, or Morris are having any sleepless nights on that account.

ADULTERATED FRENCH WINES.

In view of the interest now attaching to the quality of French wines imported here, and the law just passed by Congress empowering the President to close our ports against these wines, the following may be of value:

La France, commenting on the rumor that the measure is one of retaliation, and that the United States seriously contemplates the prohibition of all adulterated French wines, says that as there is scarcely a single bottle of wine produced in France which is not manipulated with plaster of Paris or other extraneous substances, such a measure will exclude all French wines from the market of the States, and warns the French that they had better come to terms with America, since it offers reciprocity.

THE CALIFORNIA VINTAGE.

The latest news from California is very cheering for the vineyard proprietors. The yield this year will be from thirty to forty per cent. more than last year. This is partly owing to better cultivation and partly to new vines coming into bearing. A great improvement in viticultural matters has taken place. Immense quantities of dried grapes have been sold in the East at from \$65 to \$77 per ton. They are to be used by bakers and confectioners and a small amount probably by wine makers. The result of these sales has been that, wherever the climate permits sun-drying, the grapes are sun-dried, and thus find a market, leaving only the best wine making grapes to be made into wine. Naturally this has caused a rise of from 35 to 50 per cent. in the selling price of these latter varieties. In Napa and Sandena counties there has been a still greater advance. The end will be, of course, higher prices for wines, and

thus the wine maker who has had to content himself with hopes for the future is correspondingly happy. If, with higher prices, California wine makers will maintain purity and standard, and not be tempted into affixing French and German labels, but stick to good California names, all will be well yet.

PETROLEUM.

SOME SPECULATIONS AS TO ITS PRIMARY SOURCE.

The following statements bring before us the principal views as to the origin of petroleum, viz.:

1. Petroleum is produced by the primary decomposition of organic matter, and mainly in the rocks that contained the organic matter. Of this view Hunt is one of their chief advocates.

2. Petroleum results from the diistillation of organic hydrocarbons contained in the rocks, and has generally been transferred to strata higher than those in which it was formed. Newberry and Peckham have been quoted at length in support of this general theory. Newberry holds that a slow and constant distillation is in progress at low temperatures. Peckham refers the distillation of the petroleum of the great American fields to the heat connected with the elevation and metamorphism of the Appalachain mountain system.

These views as to the date of the origin of petroleum and gas are seen to cover almost all the possibilities in regard to the subject. Hunt believes petroleum to have been reduced at the time that the rocks that contain it were formed once for all. Newberry believes it to have been in process of formation, slowly and constantly, since the strata were deposited. Peckham refers it to a definite and distant time in the past, but long subsequent to the formation of the petroliferous strata. He supposes it to have been stored in its subterranean reservoirs from that time to the present. In these several statements as to the origin, two questions are seen to be especially prominent, viz.: What particular kinds or classes of rocks are the source of petroleum? and, What is the value of the chemical processes involved in its production? In answering the first question, we find the views of Hunt and Newberry distinctly opposed to each other. Hunt counts limestone the principal source of petroleum, and denies that it has been produced by distillation from bituminous shales; while Newberry finds in these shales the main source of both oil and gas, and vigorously opposes the view that limestones are ever an important source of either. It is not necessary to follow the discussion in relation to these points further. It is enough to say that in the light of the present knowledge each statement is sustained as to its particular affirmations and inconclusive to its general denials. Petroleum is undoubtedly indigenous to and derived from certain limestones, as Hunt has so strongly asserted. On the other hand, Newberry's doctrine that the great supplies of the Pennsylvania fields are derived from Devonian shales is becoming more firmly established and widely accepted every year, though it seems likely that he has laid too much stress on bituminous shales. In other words, the theories are not uncompatible with each other. Different fields have different sources. We can accept without inconsistency the adventitious origin of the oil in Pennsylvania sandstones, and its indigenous origin in the shales of California or in the limestones of Canada, Kentucky, or Ohio. The double origin of petroleum from both limestones and shales—and it is not necessary to exclude sandstones from the list of possible sources—deserves to be universally accepted. In confirmation of this double origin, it is coming to be recognized that the gas and oil derived from these two sources—limestones and shales—generally differ from each other in noticeable respects. The oil and gas derived from limestones contain larger proportions of sulphur and nitrogen than are found in the oil and gas of the shales. Nitrogen renders the oils unstable, and sulphur compounds impart to them a rank and persistent odor from which they can be freed only with great difficulty. In the case of the oil-bearing shales of California, the petroleum is evidently derived from the animal remains with which the formation was originally filled. In composition this oil agrees with the limestone oils already described. It contains more than four times as much nitrogen as the Mecca oil of northeastern Ohio, and its percentage of sulphur is very high. Peckham says of the Pennsylvania oils: "The exceedingly unstable character of these petroleums, considered in connection with the amount of nitrogen that they contain and the vast accumulations of animal remains in the strata from which they issue, together with the facts that the fresh oils soon become filled with larvæ of insects to such an extent that the pools of petroleum become pools of maggots, all lend support to the theory that the oils are of animal origin." He speaks again of this clsss of petroleums as formed of animal matter that has not been subjected to destructive distillation. It now appears as if oil and gas derived from animal remains can be distinguished from those of the bituminous shales by the characters above described. Certain it is that the "limestone oils" differ in physical characteristics from the Pennsyivania oils, for example, in a marked degree. They are dark in color; they are heavy oils, their gravity generally ranging from 34 deg. to 36 deg. Beaume, though sometimes falling to 40 deg. or even 42 deg.; they have a rank odor, arising from the sulphurous compounds which they contain. The oils of Canada, Kentucky, Tennessee, and of the fields in northwestern Ohio all agree in these respects, and the oil and gas of the Utica shale and Hudson River group of this State fall into the same category. In the preceding statements the organic matter of the bituminous shales has not been positively referred to a vegetable source. Such a source is highly probable, but it cannot be said to be fully demonstrated until the origin of the so-called Sporangites of the shales is finally determined. There are a few geologists who are inclined to refer these forms to hydroid zoophytes (animal) rather than, with Dawson, to marine rhizocarps (vegetable). Whatever their origin, they give rise to petroleum and oil of a definite character, which is in marked contrast to that of the limestone oils. Which of these theories as to the mode and time of origin of petroleum has the most to commend it?

In conclusion, a few of the previously stated propositions in regard to the origin of petroleum that seems best supported will be concisely summarized. 1. Petroleum is derived from organic matter. 2. It is much more largely derived from vegetable than from animal substances. 3. Petroleum of the Pennsylvania type is derived from the organic matter of bituminous shales, and is of vegetable origin. 4. Petroleum of the Canada and Lima type is derived from limestones, and is of animal origin. 5. Petroleum has been produced at normal rock temperatures (in Ohio fields), and is not produced of destructive distillation of bituminous shales. 6. The stock of petroleum in the rocks is already practically complete.—Edward Orton in Annual Report U. S. Geological Survey. Published 1890.

SPICE MIXTURES.

HOW SPICES ARE ADULTERATED.

Spice mixtures are not mixtures of spice, but solely adulterants which bear a close resemblance to genuine spices. A large steam bakery in Philadelphia is employed in their manufacture. Frank A. Hennessey, Ph. G. at the chemical laboratory of the Philadelphia College of Pharmacy, has investigated the matter, and from a paper read by him we quote.

The substance which forms the base for all these mixtures, and which is designated in the sample as "meal," was found on inquiry among several millers to be a very low grade of wheat. It is not known to them by any special name, but it might be called "blow-room stuff." It is a little better than feed, to which it is sometimes added to improve the quality, but is a lower grade than middlings. Samples from lots which have been delivered to the bakery at different times were identical. The meal is made into a dough with water, rolled out, and cut in the same manner as soda crackers, and baked in an oven. These crackers, or "biscuits," as they are termed, are then allowed to dry thoroughly, when they are ready for grinding. The different shades are obtained by the use of coloring matters, which are mixed with the meal when it is being made into dough. The "white" biscuit is made from the plain meal, without coloring. The "yellow" is made with the aid of turmeric, a little of which goes a great way in imparting a rich yellow hue, such as is peculiar to mustard. A sample of the coloring matter used in "brown" biscuits, an analysis shows it to be a mixture of about equal parts of Spanish brown and turmeric. Charcoal is used in the "black" biscuits. Some biscuits having a red color, such as might have been used to adulterate cayenne pepper, were seen, but it was impossible to secure samples at the time. Large quantities of these spice biscuits have been delivered to a spice house in Philadelphia, and it is not known that any have been shipped out of the city. As they are all sent to the spice dealers in the whole condition, probably on account of the lack of facilities for grinding, the samples of powders which are presented were ground by the writer in a small drug mill, and may only roughly resemble the powders prepared by the spice millers. However, this will serve to show how closely the ground spices may be imitated. The sample labelled "pepper mixture" is made up of the "black," "white" and "brown" powders; the one labelled "clove mixture," of the "brown" and "black." "Cracker dust" is said by many investigators to be used as a spice adulterant, and a sample of this material from the same bakery is presented, although it has never been used in the manufacture of these biscuits. It consists altogether of stale bread, which accumulates in large quantities, and which is thoroughly dried and ground. An analysis of the spice biscuits gave the following results, the "black" and "white" powders and the original meal being taken:

	White.	Black.	Meal.
Moisture	7.52	8.27	....
Soluble ash (H Cl)	3.	4.98	2.95
Insoluble ash (H Cl)	Trace.	4.45	....
Total ash	3.	9.43	2.95
Glucose	14.51	14.51	14.51
Cane sugar	6.03	3.02	11.02
Residue after treatment with cold H_2O ard dried at 100 deg. C.	75.8	83.2	65.8
Charcoal and matter insoluble in boiling H_2.	....	54.1	.....
Ash of same		15.57	.....

The ash consisted of Na, K, Cu, Mg., chiefly as phosphates, with some sulphates, the insoluble portion of the "black" being fine sand. It is evident that without the most careful examination, the presence of these mixtures in ground spices might often escape notice. The starch granules are usually so much altered in the process of baking as to render their identification almost impossible.

As pure ground pepper, for instance, yields:

Moisture	8-10
Ash	2-5
Starch	34-43
Total reducing sugar equivalent	42-55

It is obvious that in case of admixture with this material, the determination of any or all of those constituents would be of no value, and it is probable that the only reliable results would be obtained from estimating the amount of piperine and resin, which is quite constant. Some points of similarity to other spices might be mentioned to show how admirably these mixtures are adapted to their purpose; but the object of this paper is simply to call attention to what is believed to be the latest development of inventive genius in this direction.

FINGER HYGIENE.

SOME TOILET HINTS OF PERSONAL APPLICATION.

The progress of bacteriology has shown that aseptic surgery means scientific cleanliness; the same lines of investigation show how very dirty people can be. Seventy-eight examinations of the impurities under finger nails were recently made in the bacteriological laboratories of Vienna, and the cultivations thus produced showed thirty-six kinds of micrococci, eighteen bacilli, three sarcinæ, and various varities; the spores of common mould were very frequently present. It is sometimes said that the scratch of a nail is poisonous. There is no reason to suspect the nail tissue; it is more likely the germs laid in a wound from a bacterial nest under the nail. Children are very apt to neglect to purify the nails when washing their hands; and this matter is not always sufficiently attended to among surgical patients. Personal cleanliness is a part of civic duty, and, as Dr. Abbott well expressed the matter in his address to teachers, should be taught to school children and insisted on in practice. The facts we have recorded might well form the text for a school homily, especially when any epidemic was in the neighborhood.—*British Med. Jour.*

RUBBER BULBS.

HOW HOLLOW INDIA RUBBER WARE IS MADE.

It is commonly supposed by the uninitiated that the bead or raised line that encircles a bulb shows the joining of the pieces of which it is made. The fact, however, is that the pieces or original parts of the bulb are invariably joined at right angles to the bead line. Long bulbs, such as syringes and atomizers, are made of two pieces; round bulbs, as pumps and balls, are made of three pieces. New and unique styles that call for variation from the established modes are daily encountered. A competent pattern maker, however, will find little difficulty, as a general thing, in so joining the parts as to secure the best results, both in vulcanizing, where the even swelling of the article must be considered, and in wear and tear, where the seams must run so as to be protected as much as possible by the general contour of the bulb. After the pattern maker has decided by measurement and experiment upon the shape and size of the parts which go to form the bulb, zinc or galvanized iron patterns are made and given into the hands of the cutters. Mixed sheets of the required thickness being spread and afterwards cut into convenient size or squares, the bulb making begins. Each piece cut must have distinctly skived edges. Considerable care is necessary in this, as the strength of the seam depends upon the smooth fitting of the edges. The three parts for hollow balls may, however, be cut with a die. The pieces, when cut, are arranged in large books with leaves of smooth cloth. If the bulb has a neck, small pegs of iron are first prepared by being cemented and wound with strips of rubber as a nucleus for the neck. The two or three parts of the bulb are then brushed with cement the whole length of the skived edge, after which they are thoroughly heated. When thoroughly warmed and softened, the bulb maker, taking a prepared peg, places the neck of one piece on the opposite side, then presses them firmly together, and, rolling the whole tube-shaped piece between thumb and forefinger, has finished the neck of the bulb. The next process is that of knitting the edges which form the seam. Holding the finished neck toward him in his left hand, with the thumb and forefinger of the right he pinches the edges firmly together for nearly the whole distance round. The shape is now not unlike that of a "long clam." Into the side aperture, which is left open, is poured a little water or liquid ammonia. The opening is then made still smaller, and, as a final touch, the maker puts his lips to the orifice, and, puffing out his cheeks till they look like miniature balloons, blows full and hard into the inside of the bulb. The softened rubber, under this sudden pressure, expands, the flattened shape is lost in a fuller and more rounded outline, while the operator, with a quick nip of the teeth, closes the opening, the imprisoned air and water holding the sides apart in symmetrical corpulency. There are those who can never learn the knack of blowing up a bulb with the mouth, but are obliged to use a bulb to inject the air. After the makers have done with the now partly made bulb, it is passed to the trimmers, who, armed with scissors with curved blades, carefully circle the seams, cutting away all unevenness, till the whole exterior is smooth and ready for the mould. In front of the trimmers are a number of shallow pans partly filled with chalk. Into these the bulbs are laid. A small dumbwaiter takes them down to the mould room and returns the empty pans. The bulbs on leaving the chalk pans are deposited in a small cylindrical box, which, turning a few times, powders them so effectually that the rubber cannot adhere to the inside of the mould. An experienced mould worker now taking one-half of a mould in his left hand, with his right gently forces the bulb into it, capping it with the second half. If the pattern maker has done his part faithfully, each will just fit its mould; if not, they will come out of the vulcanizer wrinkled, showing that it was too large, or if glazed and imperfect, that it was too small. A flat iron ring or clamp holds the two sections of the mould together when in the vulcanizer. This is tightened by iron wedges, which are driven between the mould ends and the clamp. The moulds after being keyed are piled on cars that run upon small tracks into the vulcanizers, and are cured by steam heat. When the curing process is completed the vulcanizers are opened, and the cars, by a short extension of the track, are run under a simple shower bath, which quickly cools them. They are then unkeyed, the moulds twisted open and the bulbs taken out. If the work be well done, the swelling of the liquid within its rubber prison has exerted so intense a force that every line and letter within the mould is reproduced upon the outside of the bulb, while the sulphur combining with the heat has sealed the copies with its magic spell. The iron peg in the neck is next loosened by means of a blunt awl and slipped out, leaving the bulb perfect in shape. In the mould room are large, car-like boxes, into which the bulbs are thrown. A box being full, it is trundled away to the cylinder room, where it undergoes a thorough scouring and polishing in huge, slowly revolving cylinders. When taken out of the cylinders the dirty yellow color which the bulb bore on leaving the mould has wholly disappeared. It now looks smooth, white, and finished. The neck being cut off the required length by a small, adjustable cutter (devised expressly for the purpose), the bulb is ready for the market, or for the various fittings which accompany it as adjuncts to the syringe, atomizer or other bulb. Where a smooth, clear-cut hole is needed in any part of the bulb except the neck, it is cut by a swiftly revolving punch. The neck hole is left by the iron peg, as already described. A good illustration of the power of the imprisoned steam within the bulb may by obtained by knocking a clamp off a mould before it has been treated to a shower bath. The two hemispheres of iron will fly apart as if by magic, the bulb swells to treble its normal size and explodes with a loud report. The mould workers are sometimes badly burned by hot water which bursting bulbs scatter in all directions. A well-made bulb, one which has just the right smoothness of outline, that is not scarred by imperfections in the mould, and that has the whiteness of a healthy cure, is an object that always wins the respectful admiration of rubber men. Toys, balls, and hollow goods generally are all made in the same manner as bulbs.—*Rubber World.*

LAGNIAPPE.

A CURIOUS NEW ORLEANS SYSTEM OF RETAIL PREMIUMS.

While idling away a glorious morning in the fascinating environment of French glass and mahogany, furnished by Eugene May's pharmacy at New Orleans, it was noticed that many customers, well dressed ladies and gentlemen as well as children, on paying their checks at the cashier's desk said: "linny up," or words to that effect. The result of this observation on the part of the patron was the receipt at the hands of the cashier of a small package, the sizes and shapes of the packages varying with each customer.

"Young man what does 'linny up' mean?" asked the reporter, "has everybody got it?" "is it catching?" "do many die from it?"

"By no means," urbanely replied the changer of money. "The firm are the only ones that have it. It isn't catching, it isn't dangerous, but its expensive. It really is not 'linny up' that these people say, but 'lagniappe,' a corruption of a Spanish phrase almost equivalent to the backsheesh of the Arab. It means 'give me a little present' and the little bundles which you have seen me hand out in response to the phrase, contain a small piece of licorice, chewing gum or candy. The practice is firmly established and efforts to break it up have proved unavailing."

THE ABUSE OF SOAP AND WATER.

A CAUTION TO PERSONS WITH SENSITIVE SKINS.

It is a fact that the best of things may he overdone, and Dr. B. Merrill Ricketts, of Cincinnati, has come to the conclusion (*Jour. of Cut. and Gen. Dis.*) that to the abuse of soap and water is to be attributed a certain skin affection found almost exclusively among society women, or those persons who are fastidious in the care of their skin, especially that upon the face. In this disease the skin is reddened, with more or less scaliness, and considerable burning, especially when exposed to either hot or cold draughts of wind. At times it is quite painful, often causing loss of sleep. As may be imagined, it is most common with those who have delicate, sensitive skins. The women who suffer the most are those who wash their faces frequently, at the same time using soap and water with a rough, coarse towel well applied, thereby producing an excesss in the exfoliation of the cuticle. This result is hastened by the use of the various cosmetics several times each day. Dr. Ricketts quotes the statement made to him by one who is considered a society belle that she applies Lubin's powder twelve times in thirteen hours, each time applying it after the face had been thoroughly washed with Pears' soap. He very pertinently asks, "How long would

the leather in our shoes withstand such abuse?" In such cases complete relief will follow the discontinuance of soap and water for an indefinite period, olive oil being used instead, frequently applied with some soft silk or linen fabric. When he says olive oil, he does not mean the ordinary sweet oil, or cotton-seed oil, or any of their combinations. "All that glitters is not gold," and not more than one-tenth of the oil purporting to be olive oil is genuine. Where the use of olive oil is distasteful, the face should be washed only as often as is absolutely necessary, and then an absolutely pure, neutral, unirritating soap should be used. Dr. Ricketts for the past year used what may be called "saponaceous cream," with favorable results. This is made with chemically pure olive oil and soda, with water, the result being a saponification into a smooth, gelatinous, opaque, odorless and neutral mass, which gives but little lather when used with water. The fresh albumen of an egg is thoroughly incorporated with this by means of an ordinary egg-beater, and a few drops of oil of roses, bergamot or bitter almonds may be added to give an agreeable odor. Many medicinal agents may be incorporated with this soap in varying percentages, as follows: Ichthyol, 5; iodol, 1; boric acid, 5; thymol, 3; sulphur, 5; eucalyptol, 5; bichloride of mercury, ½; tar, 10; and carbolic acid, 5.—*Medical Review.*

FROM TUSK TO PIGMENT.

VICISSITUDES IN THE CAREER OF A BILLIARD BALL.

There are few men or things that are called upon to roll into more close corners or queer situations than is a billiard bell. That is, of course after it has become a full-fledged billiard ball. Its career prior to this is, of course, rather monotonous. An elephant, either in Africa or Asia, carries it with him in his wanderings, very near to his trunk. It is then known as a tusk, and has been the cause of some tall lying in the way of elephant stories told by different persons, of whom Rider Haggard is now the foremost representative. The transition from being an elephant's tusk to being a billiard ball in good standing is not sudden. It takes time to effect it. In the first place, it is not every tusk that is suitable to make a billiard ball from. There are several factories in New York City, and they say that it takes a good while to turn out a perfect ball. The firms here, however, have to do but part of the work, for they get the tusks that are of the proper quality sent to them cut into sections, each section being large enough to allow of the turning of a single ball out of it. Most of this material comes from Hamburg. The ivory is so marked that the turners here know what part of the tusk each piece comes from, and in this way can calculate as to the grain and quality of the article. It requires skilled labor to turn out a billiard ball. One-half of it is first turned, an instrument of the finest steel being used for the work. Then the half-turned ball is hung up in a net and is allowed to hang there for a year to dry. Then the second half is turned, and then comes the polishing. Whiting and water and a good deal of rubbing are necessary for this. It is necessary in the end that the ball shall to the veriest fraction of a grain be of a certain weight. It is after being placed on the billiard table that the real life of the billiard ball commences. There are pores in ivory as there are in the epidermis. These may close, and then, if in a hot room, the ball is likely to crack, or it may crack by reason of concussion with other balls. During the first stage the billiard ball may mix in almost any society. It may gyrate under the magic cue of a Slosson, a Schaefer, a Vignaux, or some other champion, or it may be toyed with by fair dames in private billiard rooms in swell houses on Murray Hill. When it cracks it drops a step lower. It is sent to a factory and a small fraction of a nick is shaved off from it. You next see it in some second-rate billiard room on Sixth Avenue. Finally it rolls even lower and into some second-hand shop, and thence into a Bowery saloon, where "crooks" manipulate it to the dismay and discomfiture of visitors from the rural districts. The rest is soon told. The balls become cracked, decrepit, and practically useless for the purpose for which they were made. Then they are bought up by the dealers, are cut up and made into smaller articles. If the worst comes to the worst, they can be burned and used in the making of ivory black. A checkered life enough is that of a billiard ball.

OIL OF SASSAFRAS.

THE PROCESS OF ITS MANUFACTURE IN NORTH CAROLINA.

An interesting description is given by Mr. T. C. Harris, of North Carolina, in *Popular Science News*, of the process used in the manufacture of the oil of sassafras and oil of penny-royal in the old North State. The apparatus used in this work is so exceedingly rude and primative as to appear ridiculous to most observers. The still is constructed by digging a short trench in the ground, ending in a low flue or chimney, and over this trench is placed a closed wooden box, having a sheet iron bottom and an auger hole on top, through which water is poured. An ordinary barrel stands endwise on top of the steam box, and has several holes bored through its bottom, and also through the top of the steam box, allowing steam to pass freely up through the barrel. A lute of clay is used to close the joint between the lower end of the barrel and the steam box, as well as the cover of the barrel. Instead of a "worm," a tin pipe, immersed in a trough of cold water, is used, and a steam connection with the barrel is generally made by an elbow branch of wood, bored out with an auger. The sassafras tree (*Sassafras officinale*) grows abundently in this section, especially in worn-out lands, where it is usually found in dense thickets of small shrubs. The root is dug and washed free of dirt, and, after being chopped short and bruised with a hatchet is ready for the "still." This work is done by boys employed by the manufacturer, who pays a stated price per hundred pound for the root ready for use.

When the barrel is filled with the roots, and the cover made tight with clay, the process of distillation goes on rapidly. The steam passes through the mass of bruised roots, and is condensed by the tin tube into a mixture of distilled water and oil, and runs into a glass vessel set to receive it. Being of different densities, the oil and water rapidly settle into two strata, and at once can be decanted from the other.

It is said that the operator of such a "still" can pay all running expenses and make a clear profit of $3 per day. When we consider that the cost of establishing such a "factory" is less than $10 for the entire plant, and no chemical education is necessary on the part of the operator, the profit of the work is not to be despised.

The same outfit is used in the production of oil of penny royal, which grows abundantly in the woods in many counties.

COAL OIL LAMPS.

HOW THEIR EXPLOSION IS PRODUCED.

The causes of accidents to kerosene lamps is thus given in an official report by Messrs. F. Abel and Boverton Redwood made to the London Board of Safety.

The causes of explosions may be arranged under the following heads:

1. Rapidly carrying or moving a lamp, so as to agitate the oil, causes a mixture of vapor and air to make its escape from the lamp in close proximity to the flame, and, by becoming ignited, determines the explosion of the mixture existing in the reservoir.

2. Existence of an imperfectly closed filling aperature in the lamp reservoir favors explosion, owing to a vapor and air mixture being formed.

3. A sudden cooling of the lamp, owing to exposure to a draught, may give rise to an inrush of air, whereby the air space in the reservoir is charged with a highly explosive mixture, and the flame of the lamp may at the same time be forced into the air space. Blowing down the chimney to extinguish the lamp has the same effect; and if the wick be lowered very much, or the flame otherwise much reduced in size, the lamp may become heated, and its susceptibility to the effects described will be increased. Explosion in these cases is favored by the air passages being obstructed by dirt or charred wick, by the wick not being long enough to reach the bottom of the oil reservoir, and if the lamp is allowed to burn until the surface of the oil is scarcely level with the end of the wick.

4. The accidental dropping of the burning wick into the oil reservoir is a fruitful source of explosions.

If the flashing point of the oil used be just near the legal minimum, vapor is given off comparatively freely, but the mixture of vapor and air in the reservoir will probably be feebly explosive in consequence of the presence of an excess of the vapor; but if the flashing point of the oil be comparatively high the vapor will be less readily or copiously produced, and the vaporous mixture be more violently explosive. The effects are more violent if the quantity of oil in the lamp is small, and oil of high flashing point is more likely to cause heating of the lamp than one of low flashing point, in consequence of the higher temperature developed by the former, and of the greater difficulty with which some oils of that description are conveyed to the flame by the wick. It therefore follows that safety in the use of mineral-oil lamps is not to be secured simply by the employment of oils of high flashing point.

Sir F. Abel and Mr. Redwood state further that a loosely plaited wick of long staple cotton draws up the oil freely and regularly, and is altogether better and safer than a tightly plaited wick, and their experiments lead them to the conclusion that a lamp explosion is not usually sufficiently violent to cause the fracture of an ordinary glass reservoir, although in several recorded cases it has had this effect.

LARGEST LIBRARY.—The National Library in Paris is the largest in the world. It contains 2,500,000 volumes.

COOL PAVEMENTS.—It is discovered that white pavements never get so hot as dark ones, and are easier on the feet in consequence; but they reflect the heat on the person who walks over them.

A MONSTER STONE.—Vinalhaven, Maine, claims to have produced the largest stone ever brought to light. The Bodwell Granite Company recently quarried a shaft of granite which is the largest piece of stone ever quarried anywhere, and, if erected, will be the highest, largest and heaviest single piece of solid stone standing, or that ever stood, so far as any record can be found. In height it considerably exceeds any of the Egyptian obelisks. The tallest of these, which was brought from Heliotropolis to Alexandria by Emperor Constantine, and afterward taken to Rome, where it is still standing, is 105 feet 7 inches high, while the Vinalhaven shaft is 115 feet long, 10 feet square at the base, and weighs 850 tons.

AMMONIA IN SHOES.—The cleansing and deodorizing properties of ammonia make it not only an excellent application for the feet, but it may be used with hygienic benefit to the interior of the shoes. This cleansing of shoes that we wear daily, and which are the most poorly ventilated of all our attire, seems to be neglected. A solution of aqua ammonia, somewhat stronger than that used for bathing purposes, may be applied to the inner surface of the soles by means of a small sponge, attached to a flexible steel wire or band. When thoroughly dried they are a treat to the wearer. This cleansing is practically necessary to the insole on which the feet rest during so many hours of the day. It is but little trouble, and the volatile nature of the application permits the shoes to dry quickly.—*Sanitary News.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

September.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock.

MEATS.—Beef, mutton, lamb, veal, ham, kidneys, liver, venison.

FRUITS.—Apples, bananas, blackberries, gooseberries, huckleberries, grapes, melons, oranges, peaches, pears, pineapples, plums, raspberries, currants.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, rockfish, salmon, trout, sea bass, sturgeon, turtle, white fish, whiting.

VEGETABLES.—Beets, beans, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips.

PRACTICAL RECIPES.

BAKED COLD POTATOES.—Slice some cold boiled potatoes as thin as possible and lay them in a well buttered baking-dish in two layers with shred parsley, pepper, salt and butter between. Bake and serve with slices of lemon.

BAKED CHEESE.—Cut half a pound of cheese into thin bits and pound fine, or else grate it. Add by degrees the yolks of two eggs well beaten and the white of one and one cup cream or very rich milk. Mix well, bake ten or fifteen minutes and serve at once.

VEGETABLE CROQUETTES.—Chop fine any kind of cold vegetables, season with pepper and salt; mix with a well beaten egg; form into balls; dip in beaten egg and fine bread crumbs and fry a fine brown; garnish with parsley and serve very hot.

COCOANUT CAKE.—To the well-beaten yolks of six eggs add two cups of powdered white sugar, three-fourths of a cup of butter, one cup of sweet milk, three and a half cups of flour with which two teaspoons of baking powder are sifted, whites of four eggs well-beaten. Bake in jelly pans.

ICING.—Grate one cocoanut, beat whites of two eggs add one teacupful of powdered sugar; mix thoroughly with grated cocoanut and spread evenly on layers of cake when cold.

LITTLE PUDDINGS.—Make a batter of one and a half cupfuls of milk, three eggs, a dash of salt and enough flour to thicken it to a good batter. Bake in buttered patty pans for twenty minutes. When done put a spoonful of raspberry jam or preserves of some sort on the top of each and eat hot.

ORANGE BLANC MANGE.—Put one half package gelatine in one and a half cups water and boil until it is dissolved. Strain it and add the juice of two large oranges, half a cup of white wine, yolks of four eggs beaten and strained, and sugar to taste. Stir this over a gentle fire till it boils. Set it aside till it cools, then pour it into a mold to stiffen.

VEAL CROQUETTES.—Chop fine enough cold veal to make about three cupfuls. Scald one cupful of milk, a lump of butter the size of an egg and stir it into the veal with one cupful of bread crumbs, pepper and salt, Cayenne, quarter of a nutmeg, grated, a little grated onion. Stir all this together over the fire till the mixture forms together and leaves the sides of the saucepan, then let it cool; add a beaten egg when nearly cold. Form into croquettes, dip in beaten egg and bread crumbs and fry in *boiling* lard. Drain for a few moments on a sieve and serve garnished with parsley.

BUSINESS NOTES.

THE UPRIGHT PIANO.

We take great pleasure in reprinting the following from *The Opera*, the exponent of Messrs. Peek & Sons' piano house, the more so as we can from practical use of one of these pianos fully endorse every word they say of them :

"The upright piano has for years been admired for its compact construction and tasteful appearance, although its musical character lacked some of the qualities deemed indispensable by artistic players. Appreciating the important sphere which this class of pianos could be made to occupy, if once their tone was properly developed, and their action rendered thoroughly efficient and reliable, we have devoted ourselves earnestly to secure this most desirable result. Our efforts have been most amply rewarded in every particular, and we confidently present to the public our new scale Upright Piano, which is considered one of the greatest successes of modern piano manufacturing, and is proved to be so by the fact that very few manufacturers turn out as many of these instruments as ourselves; and some of our celebrated artists pronounce them superior to any in the market. We have very good reasons for success, for we have qualities in this instrument never before attained in a piano-forte. The tone is more powerful throughout the whole register than that of any square piano-forte, and it has a *long sustained singing tone*, which has never been produced in grand, square or upright before. In this respect our piano has no rival. Another point of advantage, which can be appreciated by every one, is, that it stands in tune better than any piano offered to the public. The Upright, from its compact form and elegant appearance, is especially suited to parlors and drawing-rooms, and is now the most fashionable style of piano. A general idea may be formed when we say that five thousand uprights are manufactured to every square. Its small size (very nearly less than one-half that of a square piano) allows it to be placed in the most convenient and ornamental location in an ordinary sized parlor; its shape also admits of a variety of designs and ornamentation. The 'Opera' uprights are the finest made in this country, and from the time of their introduction the most constant and untiring researches after artistic and mechanical perfection have brought them where they stand to-day—at the head of all upright pianos. These are very good reasons for their success, for they have qualities never before obtained in an upright pianoforte."

HORSFORD'S ACID PHOSPHATE.

For the tired brain from over-exertion. Try it. Dr. Ephraim Bateman, Cedarville, N. J., says: "I have used it for several years, not only in my practice, but in my own individual case, and consider it under all circumstances one of the best nerve tonics that we possess. For mental exhaustion or overwork it gives renewed strength and vigor to the entire system."

OCEAN SPEED.—Five days, nineteen hours, five minutes is the reported time made by the new steamer "Teutonic," lately arrived at this port from Queenstown. She beat by two hours the "City of New York," which started about the same time. This is said to be the fastest time by thirteen minutes ever made, being that much faster than the time of the "City of Paris."

A CHARLATAN EXPOSED.

A SILLY SECRET OF A PHILADELPHIA IMPOSTOR.

The Philadelphia *Times* has recently done a service to the community by exposing the methods practiced in the office of a person who advertised largely as Dr. A. Wilford Hall, and sold a pamphlet containing, it was claimed, a secret for the restoration of health and the prolongation of life. A curious feature of the business was the fact that each purchaser was compelled to promise on honor that he would not disclose to others what he learned from the pamphlet. The individual who conducted this business escaped the provisions of medical practice law, because he figured not as a practitioner but as a bookseller. But now the business has been fully exposed by a representative of the *Times*, who purchased a pamphlet of Dr. Hall, and found that his whole secret consisted in a recomendation.

That so shallow a device to get people's money should go on as long as this has in Philadelphia and we believe, in other cities, is a sad reflection upon the gullibility of mankind; and shows how much the community needs the sort of journals that will look after its interests, and stay awake when it is sleeping.

Of late the daily papers have done a great deal in informing the public on matters of public health, and have in many cases proved valuable allies to the medical profession in warning or advising the community. In doing this they have ranged themselves alongside of the medical journals which discuss live topics relating to the physical welfare of the community, and have very much extended the field of usefulness open to the latter.

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A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

MEAT INSPECTION.

On September 16, Secretary Rusk issued regulations to govern the inspection of salted pork or bacon for export, provided for in what is known as the Meat Inspection Bill, which recently became a law. The regulations provide that, whenever any foreign country requires inspection of salted pork or bacon imported from the United States, all the packers or exporters desiring to export to that country shall make application in writing to the Secretary of Agriculture for an inspection of their meats. Buyers, sellers or exporters of meats intended for exportation may also at any time make application to have their meats inspected. Applicants must agree to abide by the department's regulations and to mark packages as prescribed in detail in the regulations. Certificates of inspection are to be given applicants whose meats are found wholesome. Whenever inspection is requested at any other place than where the meats are packed, the opening and closing of the packages will be at the expense of the applicant. Meanwhile the "reciprocity" features of the bill give great umbrage to our British cousins. On the same day that the foregoing regulations were announced, the London *Standard*, in a tart editorial, attacked the clause in the Meat Inspection law that gives the President the power to impose penalties on foreign Governments. It says: "A more outrageous encroachment was never framed in any civilized country. It is rendered the more irritating by the fact that it is to be carried through Congress with the Tariff bill, which aims at a practical exclusion of European and Canadian products from American markets. No foreign State can submit to such thrusts without abject humiliation. So far as our continental neighbors are concerned, they are the more likely to retaliate, as they can do so effectually. If the French wines are shut out of the United States, the grain grown there may easily be excluded from France. We do not believe that American statesmen would risk so serious a retort. As for ourselves, retaliation is out of the question. We are a nation of free traders, and our manufacturers would submit to great inconveniences rather than embark on a reactionary course. Whenever our agricultural authorities deem it safe to allow American cattle free access to the interior of this country, it will be their duty to remove existing restrictions, but they will not act a day sooner on account of the unfriendly attitude assumed by the Washington Government."

SCIENTIFIC PSEUDOLOGISTS.

Probably the most popular adulterant of vinegar is sulphuric acid, one of the most corrosive poisons, yet so easily detected that it is a wonder that it is used. Now commercial sulphuric acid (commonly called oil of vitriol) almost always contains arsenic. So an inveterate vinegar user who happens to use one of those adulterated brands for quite a while might be called an arsenic-eater and be affected like one. The same may be said of constant beer-drinkers who stick to a brand that has artificial glucose used in its manufacture (as is sometimes done for cheapness), for glucose is made from starch by the use of sulphuric acid, and a rough and cheap glucose for beer makers may not have all the sulphuric acid and arsenic extracted from it. Chemists have repeatedly proven the presence of arsenic in beer. It gets there accidentally though, as above described. Picrotoxine, a virulent poison, gets in beer also, but designedly. It is put there for its bitter taste, being cheaper than hops.—*Dr. William E. Clarke.*

The amount of nonsense puplished over the signatures of *pretended* scientists would be amusing if it were not so misleading to those not conversant with the subjects treated of. The extract quoted above from one of our exchanges is a fair illustration. The statement about vinegar is obsolete. Every state and municipality now has a vinegar inspection law, and while sulphuric acid no doubt was formerly largely employed in the adulteration of vinegar, the laws have made its use impracticable, so that no vinegar can be found in the market to-day containing any sulphuric acid. Regarding sulphuric acid in glucose, when it is considered that the machinery in glucose factories is very costly, it is hardly probable that the manufacturers would allow sulphuric acid to remain in it to damage their machinery causing expensive damage, when by simple inexpensive washing it can be removed. Self-interest, when it runs parallel with the purity of the product is the best safeguard of the consumer. The same thing applies to the use of pirotoxine in beer. When hops are as cheap as they are, pirotoxine is too expensive and objectionable in taste to use.

OUR MANUFACTURING PROGRESS.

The trade statistics for 1889 of the eleven leading manufacturing industries—cottons, woolens, chemical paper, agricultural implements, flour, lumber, glass, iron and steel, and shipbuilding—are so complete and accurate that they anticipate the census reports, and furnish an instructive indication of the progress our entire industrial system has made in the last decade. These eleven industries in 1879 had $1,165,000,000 capital invested in them, and 844,776 hands employed; they paid out in wages $256,795,000, consumed $1,197,000,000 worth of raw materials, and showed a gross product of manufactures of the value of $1,774,000,000. In 1889 they had $1,784,840,000 capital invested, and 1,274,000 hands employed; they laid out in wages $320,689,000, consumed $1,586,000,000 worth of materials, and gave a product of manufactures of the value of $2,293,779,000. The increase has been in capital invested, $619,740,000; in the number of hands employed, 429,224; in the amount of wages paid out, $93,894,000; in the materials consumed, $397,000,000; and in the value of the product turned out of $519,779,000. There is over 50 per cent. more capital invested in the specified manufactures than there was ten years ago, 50 per cent. more hands employed, over 36 per cent. more wages paid out, over 30 per cent. more material consumed, and nearly 30 per cent. greater product.

RADAM'S MICROBE KILLER.

Mr. William M. Searby, of San Francisco, in a paper read before the California Pharmaceutical Society, says that the proprietor "has forced on the community a remedy that is absolutely dangerous, probably the most dangerous that has ever been put before the public." An analysis by Professor Wenzel of the stuff as sold in San Francisco shows that about a gallon of it consists of the following ingredients: Sulphuric acid, 278.2 grains; common muriatic acid, 105.2 grains; claret, a sufficient quanity to color; Spring Valley water, 1 gallon.

WOMEN'S WORK.

SOME PRACTICAL ILLUSTRATIONS OF THE TRUE WOMEN'S RIGHTS MOVEMENT.

Mrs. Anna Garland Spencer has charge of a church in Providence, R. I. She has the reputation of being one of the best speakers in that city.

Miss Agnes Lowe, who is described as an attractive young woman, with a penchant for pretty clothes, has been awarded the first prize in the annual oratorical contest in the Wisconsin University

Mrs. Anna A. De Barr has received a license as mechanical engineer from the Chicago Board of Engineers. Thus woman marches triumphantly forward. A few years ago Mrs. De Barr would have been barred out.

Miss Alice Foxall, a student of University College, Cardiff, Wales, resident at Aberdare Hall, has been placed second on the list of successful candidates for the M. A. degree of philosophy of the London University.

The oldest Sister of Mercy in America is Mother Seton, of the New York Convent of Mercy, who is over ninety. Her father died in 1800. Her mother, a convert, founded the Order of the Sisters of Charity at Emmitsburg.

Miss Abbie H. Fairfield has compiled a little volume of appropriate daily readings for ambitious youth who are just growing into manhood. It is appropriately entitled "Starting Points." It is a companion volume to Miss Ryder's "New Every Morning."

Miss Sallie Hollie, a Virginia girl, has undertaken the education of the colored girls of her State. She proposes to establish small schools throughout Virginia, where the colored girl can learn enough in two years to start squarely with the world.

Mary E. Bole, valedictorian of the New York Normal College, took the Kelly bronze medal for methods of teaching, the Kane gold medal for physiology, the first prize in French, a gold watch, and honorable mention for the DeWitt J. Seligman prize for English literature. Her class average was 964.5,

Miss Harriet Hosmer has completed the model for the Crerar Lincoln Memorial, on which she has been engaged since last December. She expects to leave for Europe on the 20th or 27th of September, and will be in Rome in October. On the way she will stop a few days in London, to search through the British Museum for ideas of costuming in the time of Queen Isabella. She hopes to return late next winter with a wax model of her statue of Queen Isabella, which, it is expected, will be one of her greatest works. She will be represented at the World's Fair by this statue and a pair of bronze doors.

Mrs. Reginald De Koven, daughter of Senator Farwell, wife of the clever composer of "Robin Hood," is the president of the Friday Club, a sort of ethical-æsthetic organization composed of about one hundred of the Chicago young women of the North Side. The Friday meets once a week in some senior's drawing room, and spends an afternoon getting snarled in Browning, Dante, Ibsen, Tolstoi and kindred philosophy. Every few months there is a tea, to which the young husbands and brothers are invited and at which Mme. President is hostess. Having had several seasons in Washington and a summer or two on the Continent, she is considered authority on reception formalities.

Miss Minerva Parker, whose plans for the Queen Isabella pavilion at the Chicago World's Fair were preferred to all others by the committee on the building, received her instructions in the profession in Philadelphia, although she is a born Chicagoan. She studied at the Pryne Art School, took a two years' course and graduated at the Franklin Institute, and finished her art education at the School of Design. The young woman is settled at Philadelphia, and gives domestic architecture her special attention, having designed houses at Johnstown, Radnor, Elm Stations, Overbrook, Lansdowne and Berwin, among other places in Pennsylvania. Miss Parker is the only woman architect in Philadelphia. The only other women practising this profession in this country, Mrs. Louisa Bethune, dwells in Rochester, N. Y.

Miss Beatrice Potter is at present one of the most famous and talked-of women in England. She is a superbly beautiful woman, is of aristocratic connections, and owns a large fortune in her own right. For several years past she has been a devoted pupil and disciple of Herbert Spencer. Having read and heard all manner of grewsome stories of the horrors endured by women in sweaters' shops, she dressed herself in the odious rags worn by that class, went down into the city, found work, and for two months lived and labored side by side with these miserable white slaves of the needle. Few knew her secret, and so cleverly were her plans carried out that neither employers nor employes ever suspected her identity. When she had thoroughly informed herself on all minutiæ relating to the criminal tyranny exercised by the sweaters, and on the hideous lives led by their female victims, she threw off her disguise, returned to the West End, gave exhaustive newspaper interviews, and appealed for legislative interference. So strong and unanswerable were her arguments, seconded by her own experiments, that Parliament discussed ways and means for righting this great wrong.

OXALIC ACID BAKING POWDER.

THE SCIENTIFIC PRESS DISCUSSING ITS MERITS.

(*Popular Science News, September.*)

A much more dangerous adulteration of food is found in a baking powder sold under the name of "French Tartar," which, according to the AMERICAN ANALYST, contains varying amounts of oxalic acid as one of its ingredients, some samples showing as much as 40 per cent. of this extremely poisonous substance. If these statements are correct, no punishment would be too severe for such criminal ignorance or recklessness as has been shown by the manufacturers. In any case, there is nothing to be gained by buying cheap baking powder, and the only safe way is to use that prepared by firms of well-known reliability, even if the cost of such powder is slightly higher than that of unknown strength and composition. It is, however, only fair to say that the powder above referred to has been certified by a firm of New York chemists to be "free from adulterants."

(*Druggists' Circular, September.*)

Dr. Arvine's French Tartar, a baking powder manufactured by F. W. Arvine, of this city, has lately been analyzed, and according to reports in the daily press, was found to consist of oxalic acid and corn starch, with small quantities of soda, lime and phosphoric acid. The powder is made in different strengths, in some the oxalic acid running, it is said, as high as 40 per cent. The attention of the Board of Health has been called to the matter. Dr. Arvine disputes the correctness of the analysis.

FACTS ABOUT FLIES.

A POPULAR ERROR AS TO THEIR FEET CORRECTED, AND THE BABY FLY MITH ABOLISHED.

"The popular notion that house flies walk on the ceiling by the help of the suckers on their feet is a mistaken one," said a man of science to a reporter. "Notwithstanding the testimony on this point of many old and respected authors, the fact is that the fly has no suckers on his feet at all, but each of those six members ends in a pair of little cushions and a pair of hooks. The cushons are covered with ever so many knobbed hairs, which are kept moist by an exuding fluid. Thus a fly is able to walk on a smooth wall or ceiling or window pane, and apparently defy the law of gravitation by the adhering power of the moist hairy pads. You will understand the theory of it if you will touch the moistened end of your forefinger to the window glass or any smooth surface and observe the perceptible adhesion. For walking on rough surfaces the fly's foot cushions are of no use; but the insect is provided with the twelve strong hooks mentioned to do its rough travel with, clinging by them to any such surface as a whitewashed wall or cloth. Another prevalent fallacy is that the smaller flies seen in houses are young ones. As is the case with all insects, the fly's growth is accomplished in the larva state; it ends with the issuing from the paupa and the expansion of the wings. Individual flies differ in size or maturity, just as is the case with man and other animals. Every house fly that you see was once a crawling maggot. The eggs laid by the female fly are usually deposited in warm manure or in decomposing vegetation. Each stable in summer that is not kept remarkably clean is a hatching and propagating place for flies. Within twenty-four hours after the eggs are laid they are hatched out into footless maggots, which inhabit the filth they are born in for a week and then contract to little brown objects known as puparia. Within this hardened skin the maggot is transformed into the perfect fly, which crawls out of the puparium five days later, already grown to full size, and wings its way to share your luncheon. A fly lives about three weeks. When the cold weather comes the flies nearly all die; but a few vigorous females remain topid in nooks and crannies, thus surviving the winter and continuing their species.

NAMES AND PLACES.

ORIGIN OF THE NAMES OF FAMILIAR FABRICS.

Damask is from the city of Damascus; satins from Zaytown, in China; calico from Calicut, a town in India, formerly celebrated for its cotton cloth, and where calico was also printed. Muslin is named from Mosul, in Asia; alpaca from an animal in Peru of the llama species, from whose wool the fabric is woven. Buckram takes its name from Fostat, a city of the middle ages, from which the modern Cairo is descended. Taffeta and tabby from a street in Bagdad; cambric from Cambrai. Gauze has its name from Gaza; baize from Bajac; dimity from Damietta, and jeans from Jean. Drugget is derived from a city in Ireland, Drogheda; duck comes from Torque, in Normandy; blanket is called after Thomas Blanket, a famous clothier connected with the introduction of woolen into England about 1340. Serge derives its name from Xerga, a Spanish name for a peculiar woolen blanket. Diaper is not from D'Ypres, as it is sometimes stated, but from the Greek *diaspron*, figured. Velvet is from the Italian *vellute*, wooly (Latin, *vellus*—a hide or pelt). Shawl is the Sanscrit *sola*, floor, for shawls were first used as carpets and tapestry. Bandana is from an Indian word to bind or tie, because it is tied in knots before dyeing. Chintz is from the Indian chott. Delaine is the French "of wool."

HEROIC REMEDY.

THE APPLICATION OF BEE STINGS FOR RHEUMATISM.

Dr. Al. Laboulbene, at the meeting of the French Entomological Society, held on March 13, 1889, gave a short abstract of a paper published in 1888 by an Austrian physician, Dr. Terc, who seems to have made extended experiments for a number of years. Dr. Terc

asserts that a person stung by bees acquires thereby a relative immunity from the consequences of subsequent stings; in other words, that the virus of the bee sting acts like a vaccinal inoculation against its own poison. The immunity lasts six months, sometimes less, probably according to the number of stings inflicted on a person. Persons suffering from acute rheumatism require a larger number of bee stings to feel the usual effect of the poison, but as soon as by inoculation of a sufficient amount of virus they have acquired immunity against its effect, they will—as long as this immunity lasts—be free from rheumatic attacks. Dr. Laboulbene suggests that, in the interest of medical science, it would be well to thoroughly test these assertions.

OZOKERITE IN GALICIA.

WHAT IT IS AND HOW OBTAINED.

Ozokerite is a species of paraffine and is much used for making candles, also for the adulteration of beeswax. The most important deposit of ozokerite is near Borislaw, where it occurs in a marl containing salt. The wax is found in irregular lumps, sometimes of great size, or in layers which frequently die out completely. The neighboring rock consists of clay-slate marl and sandstone. The centre of the basin is richest in wax; in some cases masses of such extent have been tapped that the miners have hardly had time to escape before the workings were filled with the plastic mineral. Such a deposit was recently found in the deepest shaft at Borislaw at a depth of 208 meters (227 yards). In general, however, the yield of wax varies at from two to eight per cent. of the mineral extracted. Ozokerite was first found in this district in 1854 by Doms, who was in search for petroleum, with which much of the ground is saturated. At first it was regarded as an unwelcome companion to petroleum, as it frequently caused the timbering of the shafts to collapse. It was not until about twenty years later that this substance began to attain commercial importance, a method having then been discovered of producing from it a substance resembling beeswax, and named ceresin. In 1865 ozokerite, which had previously been regarded as a crown mineral, was declared free, and the consequence was that a number of shafts were sunk in the district and much speculation ensued. The land being parcelled out in small plots, the shafts were sunk in the immediate neighborhood of each other, and much waste and danger ensued. In 1886 the present law was passed, according to which the right of mining ozokerite may be separate from the ownership of the land. The extraction is now carried out under official supervision. In nearly every case the mineral is raised through vertical shafts or pits, over which a wooden roof is erected. The section of the shaft in the first instance is 3 to 4 sqare meters (32 sq. ft. to 43 sq. ft.), but when the ozokerite formation is reached an inner shaft, one meter square (10.76 sq. ft.) is formed of timber, and the space between this and the timbering of the larger shaft is filled with a rich clay. This construction is adopted to exclude the surface water, which is kept down by hand pumps during sinking. From the bottom of the shafts levels are driven into the ozokerite ground, the richer portions being raised and the refuse used to fill up the old workings. The softer parts of the marl are dislodged by means of pick or wedge; but where the rock is hard, and the permission of the mining authorities can be obtained, dynamite is used. The mineral is raised by hand in skips or tubs holding 40 to 50 kilos (88 to 110 pounds). Hand ventilators are used for the purpose of ventilation, but explosions of gas are not uncommon, especially after Sundays and holidays. Fatal accidents are, however, rare. Safety lamps are used in all the mines. The timbering of the shafts requires constant renewal and repairs; in some cases it is almost impossible to keep the shafts perpendicular. The water is usually raised in tubs, and much difficulty is experienced in getting rid of it after it reaches the surface, on account of the numerous shafts and the broken nature of the ground. The mineral when it leaves the tubs is sorted by hand. The waste rock is picked out and tipped to spoil, lumps of ozokerite are specially selected, and the remainder of the rock, containing fragments of wax, is tipped into tanks full of water. On being well stirred the most of the wax rises to the surface and is skimmed off. The residue still contains from 2 to 3 per cent. wax. The quantity of waste mineral being considerable, and the distance between the shafts small, a special railway has been built to remove the residues from the immediate neigborhood of the mines. Only one attempt has been made to mill on a large scale for ozokerite. In this case a circular shaft 2 meters (6 ft. 7 in.) in diameter, and lined with iron tubing, was sunk outside the ozokerite zone, and the deposit was reached by galleries. Trucks holding 500 kilos (1,102 pounds) were used, and both ventilation and pumping were done by steam power. The operations on a large scale do not, however, seem to have been successful, the French company which carried them out having now ceased working. The production of ozokerite in the Borislaw district amounted in 1887 to 96 per cent. of the total output in Galicia, and was valued at £152,900.—*Allg. Oest. Chem. und Tech. Zeit*,

CALIFORNIA ASPHALTUM.

A NEW MINING ENTERPRISE.

Asphaltum is mined to a considerable extent in California, but the annual production is quite irregular, being governed by the local demand. When a great deal of iron pipe is being laid, large quantities of the substance are used in coating it. Asphaltum is found in the counties of San Luis Obispo, Santa Clara Ventura, and Santa Barbara. Between 2,000 and 3,000 tons a year are shipped from the deposits. The mines of the Ventura Asphalt Company, in the Canyon Diablo, Rancho San Miguelto, have come into prominence since 1888, when they were discovered. The material is found at or near the surface. About 1,800 tons have been so far shipped from this deposit. More or less prospecting work has been done, but now large cuts or tunnels are being run into the deposit. At the point now being worked the elevation above sea level is 1,300 feet, but frequent fossils of shells, shark's teeth, etc., are found, showing that the mass came up from the ocean. The vein or bed crops out at many points in the shape of fingers or rounded masses connecting with the main body, the width and length of which are unknown, but upon which breasts of 45—16 feet have been worked. The quality of this asphaltum is unique, possessing as it does great toughness and hardness, and a larger amount of fixed bitumen than other known deposits. The percentage of fixed is 24.40. It fluxes readily in oil, coal tar, and by hydrocarbons, and may be made permanently of the hardness of stone or the pliability of india-rubber, according to kind and quantity of flux (solvent) employed and the manner and time of melting, etc. It has been successfully employed in street paving, and is found not to soften by heat or crack by frost. It is in use for this purpose in several cities in California, Utah, Washington, British Columbia, Mexico, Guatemala, Sandwich Islands, and Australia. For cementing masonry it has been put to use in San Francisco, Santa Barbara County, and other places. The Southern Pacific Company built a piece of sea wall along the seashore, Ventura County, which was built up of round cobbles cemented together by this asphalt. Two years' trial shows no indications of the wall being injured. A peculiarity of the Ventura asphalt is that it is elastic. The Santa Anna Water Company used it for plastering a reservoir, having first laid up a wall of cobblestones on puddle and then plastering this with hot asphalt. In this open reservoir no change in the material is seen; even in places where the wall settled and cracked, the coating stretched and bent, remaining perfect and sustaining the water pressure. A pile coated with this asphalt was driven at Goat Island without destroying the coating. In doing this, the weight of 3,000 pounds was dropped twenty-two feet on the pile. The material can be used for coating iron, planks, pipes, etc. Inquiries for the substance from the Eastern States, England, France, Australia, and Central America promise an important shipping business, unless other deposits with such exceptional properties are found.—*Min. and Sci. Press.*

NATURAL RARITIES.

SOME UNCOMMON BUT USEFUL METALS.

There are quite a number of metals which are very sparingly distributed over the earth, and which few people have ever seen, but which have some exceedingly useful applications in the arts, and, in small quantities, are in almost constant use. Hydrogen, the lightest of all the elements, was discovered by Cavendish in 1766, and is considered by the best authorities to be a gaseous metal, just as mercury is a liquid metal at ordinary temperatures. Very few persons have ever seen solid hydrogen. Mercury becomes solid at —40 deg., but, according to Professor Pictet, hydrogen gas requires a temperature of —140 deg., and pressure of over two tons to the square inch before it liquefies even. By suddenly removing the pressure from this liquefied hydrogen, the cold produced by its evaporation is so great that a part of it solidifies into a state resembling metallic grains, which remains visible for several minutes. Its metallic nature is also rendered probable by its directly uniting with a metal resembling platinum, and known as palladium, to form a sort of alloy. The weight of a single molecule of hydrogen has been calculated not to be greater than one ten thousand millionth of a gramme, and a cubic centimetre of the gas contains at least twenty-one trillions of such molecules. Although these figures are quite incomprehensible to the human mind, they must be approximately correct, and represent actual and existing magnitudes. Lithium is a quite rare mineral, which occurs in some varieties of mica, and also in small quantities in the waters of certain mineral springs. It is considered to possess a distinct medicinal value by some physicians, and is probably taken into the system, at least, as we have detected it by spectroscopic analysis in the blood of a person who had been drinking a strong lithia water. Barium is a metal closely allied to calcium, the metallic base of lime. It is cheaper than white lead, and is not changed in color by the sulphur compounds often present in the air, but possesses less covering power then lead, and is less permanent in other ways. The peroxide of barium is used in the preparation of peroxide of hydrogen, and the phosphorescent sulphide of barium is a constituent of some varieties of luminous paints. The green fire used in pyrotechny is also due to the presence of this metal in the form of a nitrate. Strontium, which is, chemically speaking, the brother of barium, is even more rare, but is used in large quantities in the manufacture of red fire. A small quantity of salt of this metal, when volatilized in a flame, imparts a magnificent crimson color to it which can be obtained by no other substance. The nitrate of strontia is the salt most commonly used for this purpose. It is a curious fact that the spectroscope shows that the light from incandescent strontium also contains a large proportion of blue rays, which are, however, masked by the much greater brilliancy of the red ones. Magnesium, formerly very rare, has recently become a comparatively common metal. It burns in the air with an extremely brilliant light, which is very rich in actinic or chemical rays. This property renders it useful in photography, and fine pictures can now be obtained at night or in dark rooms by the "flash" of a few grains of the powdered metal blown through a flame. Cadmium is a metal resembling zinc, and usually occurring in the same ores. It has a limited but important use in the arts as a constituent of the fusible metal used for making

low-water plugs in boilers, and automatic sprinklers for factories, where the metal melts and allows a water valve to open when the temperature reaches a certain point. An alloy composed of three parts of cadmium, four of tin, fifteen of bismuth, and eight of lead, melts at about 160 deg. Fahr.—much below the boiling point of water. Sulphide of cadmium is of a brilliant yellow color, and is used by artists as a pigment. Cerium is a rare metal of the aluminium type, which is of value only from its supposed medicinal properties, being considered by some physicians to be of great value in certain forms of nausea. Vanadium is now used in considerable quantities in dyeing and cloth-printing works, on account of the remarkable oxidizing properties of some of its compounds. It not only changes chloride of aniline into aniline black, but retains the power to an unlimited extent, so that a small quantity of vanadium salt will produce an indefinite quantity of aniline black. It seems to be alternately reduced and oxidized, thus acting as a carrier of oxygen to the aniline, but its peculiar action is not well understood. A few drops of vanadate of ammonia added to a decoction of galls forms a very fair black ink, which, however, soon fades into a permanent brown color. It is a quite uncommon metal, and the principal source of supply is from the slag of the Creusot steel works in France, which contains two per cent. of vanadic acid. The salts of a metal called tungsten are used to render light cloths uninflammable. A very superior quality of steel is also obtained by alloying it with a small quantity of the metal. The "Mushet" steel is prepared in this way. Iridium is usually associated with platinum, and it is even more infusible and insoluble, besides being very much harder. By combining it with a small amount of phosphorus it becomes more fusible, without losing much of its hardness. The so-called "diamond" points of gold pens and stylographs are made of this metal, and it has now replaced agate for the knife edges of chemical balances, and in other scientific apparatus. Zirconium, or rather its oxide zirconia, has recently found an extensive application in the manufacture of the "hoods" for the Welsbach incandescent gas lights. This oxide, when heated in a gas flame, glows with a pure steady, white light, equal to that of the incandescent electric lights, and costing much less. Selenium is not a metal, but belongs to the sulphur group of elements. We must mention, however, the wonderful property by which its electrical conductivity varies according to the amount of light falling upon it, just as the chemical relations of silver are altered by the same means. By this power Professor Bell was enabled to construct an optical telephone, and actually transmitted words and sentences between two distant points which were not connected in any way except by a beam of light, which faithfully carried the vibrations of his voice to a selenium disk, by which they were transformed into electric energy and reproduced in an ordinary telephone. Whether we shall ever be able to see our friends at a distance, as we now talk with them, is exceedingly problematical; but if we ever do so, it will doubtless be through this mysterious connection between light, electricity and the element selenium.—*Popular Science News.*

SPONTANEOUS COMBUSTION.

IGNITION OF HAY BY MEANS OF A FUNGUS.

After a series of very careful experiments, Professor Cohn, of Breslau, has found that the heating of damp hay to a temperature sufficient to cause the spontaneous combustion of it is due to a fungus. He first studied the heat-generating action of *Aspergillus fumigatus*, which has the bad reputation of heating barley in the course of germination and of rendering it sterile. Through the effect of the respiration of the little germ—that is to say, through the combustion of the starch and other hydrocarburets which the diastasic ferment converts into maltose and dextrine, the temperatnre is raised by about 40 deg. The heating of the germs to more than 60 deg. occurs only through the intervention of the *Aspergillus*, which acts as a ferment. Under these conditions it reaches its greatest development and produces its maximum action. In this state it rapidly burns the hydrocarburets.—*La Petite Revue.*

OCEAN TRAVEL.

THE COST OF RUNNING A TWIN SCREW PASSENGER SHIP.

What does it cost to run a palatial twin screw racer across the Atlantic? That is the question which the *Sun* for the enlightenment of many inquiring readers, recently put to the New York agents of several big steamship companies. The questioner was about to file the query away with a lot of other unsolved riddles of the sea, when he strolled into the office of the Hamburg-American line. There he obtained the information which had been withheld at every other office. Agent E. L. Boas, dissipated, as well as he was able, the mystery that had enshrouded the little problem. A midsummer trip of the magnificent Normannia was the theme of his calculation. The Normannia is not quite as big as the twin screw boats of the White Star and Inman lines, but her expense account, owing to the greater length of her voyage, is just as formidable. The cost of running her from her dock in the Teutonic town of Hoboken to her dock in the town of Hamburg, no less Teutonic, perhaps, is about the same as the cost of running the City of Paris from New York to Liverpool. When the Normannia starts on an eastward voyage she carries nearly 3,000 tons of coal in her protected bunkers. Some of this is American and some foreign soft coal, and it costs about $3.50 a ton. The sooty stokers daily shovel into her roaring red furnaces between 250 and 300 tons. The expenditure for coal runs just short of $1,000 a day, or nearly $8,000 for the voyage. The cost of the gallons and gallons of oil used to keep the ponderous triple-expansion engines, her dynamos, her numerous smaller engincs, her pumps, and so on, running smoothly, combined with the coal bill, is quite $8,500. The salaries of the big ship's company are not an unimportant factor in the expense account. Among 300 persons who look after the working of the racer and the comfort of her passengers, are, besides cool-headed Capt. Hebich, 8 officers, 1 surgeon, 25 engineers and machinists, 2 pursers, 5 boatswains, 28 seamen, 114 firemen, 65 waiters and waitresses, 22 cooks, bakers, and assistants, 2 carpenters, 1 barber, and 14 skilled musicians. The total wages of these for a trip of eight days is about $2,000, not counting perquisites. Capt. Hebich receives the highest salary. It varies between $3,000 to $4,000 a year, and depends somewhat on the earnings of the ship, of which he receives a small percentage. This is the way the skippers of all the colossal racing craft are paid, and it is not likely that any of them are going to cease racing, or to be censured for it, as long as a fast trip means money in their pockets and in the coffers of their company. Every hour the captain of the City of New York saves means a saving in coal alone of $50. Next in importance to the captain of an ocean speeder is the chief engineer. He is not as frequently visible to the cabin passengers as his gold-laced superior, and nobody makes much fuss over him, but he is, in the opinion of his employers, a very big man indeed. He is the man who makes the great ship "git up and git." He submits daily reports of how things are going on down below to the captain. He tells how many tons of coal he is using, how much indicated horse-power he obtains, and the number of revolutions the ship's propellers make a minute. If he doesn't get as much speed out of the clanking twin giants as the captain thinks he ought to, the captain pats him on the back and tells him to whoop her up, like a good fellow. It is essential to the captain's interest that he should be friendly with the boss of the mighty machines. For his great work the chief engineer receivas $160 a month and his board, which is equal to that of the cabin passengers. The chief officer receives $80 a month, which is more than the captains of many steamships of the second class get. The food and drink consumed by passengers and crew during a recent trip of the Normannia cost about $16,000. This is the complete list of the things that were necessary to make life aboard the luxurious floating hotel something like a dream. Two thousand five hundred bottles of red wine, 2,000 bottles of Rhine wine, 2,000 bottles of champagne, 1,200 bottles of cordials, 15,000 bottles of beer, 80 kegs of beer, 400 bottles of ale and porter, 2,500 bottles of mineral water, 37,000 gallons of drinking water, 70,000 pounds of potatoes, 16,000 pounds of beans, peas, and so on, 2,500 cans of fruit, 1,500 pounds of jellies, tarts and biscuits, 45 baskets of vegetables, 7,000 pounds of butter, 1,200 pounds of cheese, 10,000 eggs, 3,500 pounds of sugar, 1,500 pounds of coffee, 1,000 pounds of tea, 250 pounds of chocolate, 150 gallons of milk, 10,000 apples, 1,200 oranges, 1,000 lemons, 400 glasses of preserved fruits, 120 barrels of flour, 65 gallons of ice cream, 17,000 pounds of beef, 12,000 pounds of mutton, 1,800 pounds of ham, smoked beef, and bolognas, 1,000 pounds of veal, 700 pounds of bacon, 600 pounds of pork, 600 pounds of game, 500 pounds of canned meat, 250 pounds of lamb, 30 barrels of preserved meat, 20 barrels of salt pork, 16,000 pounds of fish, 450 chickens, 180 ducks, 60 turkeys, 60 partridges, and 50 geese. From the foregoing facts and figures it may be said that one trip of the Normannia costs the Hamburg-American line not less than $25,000. To offset this expenditure, which does not include the cost of insurance, the Normannia must carry many passengers and some freight. The number of her passengers varies, of course, according to the season. She carries in midsummer sometimes nearly 500 first and second cabin and about 300 steerage voyagers. The average price of a first cabin passage is about $110, and that of a second cabin about $60. The average price of steerage accommodations is $22. The receipts from all classes of passengers on a good midsummer trip are over $50,000. Usually the Normannia carries 800 tons of freight, which, at the transportation rate of about $10 a ton amounts to $8,000. The cost of loading and unloading this freight is borne by the company. In the dull season, the big twin screw ships do not make much, but their receipts throughout the year are large enough to warrant the declaration that they are great successes financially, and that they are the passenger ships of the future.

AN AMUSING BLUNDER.

UNDERTAKING TO TRANSLATE WITHOUT UNDERSTANDING THE LANGUAGE.

Miss Cooper, a daughter of the novelist, James Fenimore Cooper, states that, when in Paris, she saw a French translation of her father's tale, *The Spy*, in which there were several mistakes, but one of them was such that it was almost incredible that any one could possibly have been guilty of it. The residence of Mr. Wharton, one of the characters who figure in the story, is spoken of by the author as "The Locusts." Now, the translator had been evidently ignorant of the circumstance of there being any species of trees bearing this name. Having, therefore, looked out the word in his dictionary, and finding the definition to be given as "Les Sauterelles," grasshoppers; thus he rendered it in the text. Presently, however, he came across a paragraph in the novel in which it was stated that a visitor to the house of Mr. Wharton had tied his horse to a locust. Then it might be naturally supposed that the translator would at once have discovered his error. Not a bit of it! His reasoning would appear to have been somewhat on a parity with that of a celebrated countryman of his, when he declared that "if the facts do not agree with the theory, so much the worse for

the facts." Nevertheless, the writer seems to have been conscious that some explanation was due of so extraordinary a statement as that a horseman had secured his steed to a grasshopper. So he went on to gravely inform his readers that in America these insects grow to an enormous size, and that in this case one of these —dead and stuffed—had been stationed at the door of the mansion for the convenience of visitors on horseback!

FOOLHARDY HASTE.

THE RECKLESS RISKS MEN RUN TO GAIN A FEW MOMENTS OF TIME.

There is a vast amount of dreadful risk, according to a writer in the *Travelers' Record*, which could just as well be avoided as not, without getting a workman into trouble with his employer or making him late for his meals, without making a business man forfeit engagements or a wealthy gentleman forfeit sport. When a brakeman couples cars with his fingers instead of a stick, there is nothing to be said—he practically must; but when a workman drops off a suburban train into a web of switch tracks to go home, instead of riding forty rods farther and taking the highway, he is risking his life for three minutes' time which he will probably spend waiting for supper; when he hangs off the rear platform instead of sitting in the car, he is risking it for usually not above half a minute, which he can put to no earthly use; when a business man drives over a grade crossing without gates near a curve, he has no real choice—he can't be expected to go three miles around to avoid it; but when he gets off a train on a bridge in the middle of a dark night to see what it has stopped for, and tumbles through and is drowned, he is throwing away his life to gratify an idle curiosity. A large share of this sort of accidents comes from vanity—the feeling that caution will be taken as a proof of timidity or rawness. Many men will not be even decently careful for fear of being thought greenhorns or cowards. The more dangerous the business, the stronger this feeling is: where the carnage is so deadly that a state of war is safe and humane beside it, you can hardly get men to take any care at all. Workers in sawmills and rolling mills and railroad brakemen—the three most dangerous of common employments—are not only proud of disregarding the commonest precautions, but are enraged at any being enforced on them by their employers, and will evade them and destroy safety appliances whenever they can; and many of the most dreadful accidents to engineers, carpenters, and other workmen, have come from wilful courting of destruction. But in their own way, many business and professional men are just as foolhardy and as vain of defying common prudence. We need not multiply instances; we will not only add that for men to get drunk is so entirely within their own choice, and so absolute a surrender of all possibility of care, that no company could cover it and live a year. Nothing, either in business or society, ever puts even a virtual compulsion on men to do that. A striking confirmation of our views as to the extent of mere carelessness is afforded by the last report of the New York State Board of Railroad Commissioners. The most enormous destruction was through walking on the tracks—the crowning example of all folly, because it is not only a terrible risk but the most fatiguing of tasks, and there are always fair roads substantially parallel. Why it is done we could never guess, yet, despite legal prohibition and railroad companies' dislike, the tracks are never disused by pedestrians. In New York, in 1889, the shocking total of 284 persons were killed outright, besides 118 injured, while so doing. The total number of casualties on the roads to "others than passengers and employes" was 376 killed and 278 injured—practically all by their own fault; while of passengers only 22 were killed and 135 injured, and even of employes but 191 were killed. This is an exhibit of which the railroads may be proud.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

September.

Game and Poultry.—Pigeon, chicken, duck, woodcock.

Meats.—Beef, mutton, lamb, veal, ham, kidneys, liver, venison.

Fruits.—Apples, bananas, blackberries, gooseberries, huckleberries, grapes, melons, oranges, peaches, pears, pineapples, plums.

Fish.—Bass, blackfish, bluefish, clams, cod, crabs, eels, flounder, halibut, herring, lobster, mackerel, mussels, porgie, prawn, rockfish, salmon, trout, sea bass, sturgeon, turtle, white fish, whiting.

Vegetables.—Beets, beans, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips.

PRACTICAL RECIPES.

Fish Cutlets.—Put one cupful milk over the fire; when it boils add one large tablespoonful butter, rubbed into three tablespoonfuls flour. Stir till this is smooth and thick, then add the yolk of an egg and two cupfuls of cold fish; mix lightly, add a dash of nutmeg, one-half teaspoon grated onion; salt and pepper to taste; turn it out to cool; form into cutlets, dip in egg and bread crumbs, and fry in boiling lard.

Vanilla Charlotte Russe.—Let three teaspoonfuls of gelatine soak for two hours in just enough water to cover it; line a square cake-pan, or, better still, charlotte russe mold, which holds one quart, with lady-fingers, first dipping their edges in icing and then fitting them neatly in the mold so that they will stick together; whip very light one pint sweet cream; pour one-half cup boiling water on the gelatine, and let it thoroughly dissolve. Beat the cream with an egg; whip, and, as the froth rises, take it off and put it on an inverted sieve to drain; beat till no more froth rises; put the cream in a stew dish, set in a pan of ice water, and add to it three tablespoonfuls powdered sugar and the dissolved gelatine; flavor with vanilla, beating constantly. Fill the mold with the cream, set away for a few hours to stiffen and serve.

Burnt Almond Charlotte Russe.—Let a good tablespoonful of gelatine soak two hours in just enough water to cover it; blanch one-half pound almonds, chop them into small bits; melt one-half cup granulated sugar over the fire, brown it, and add the nuts; stir for a few moments, turn them out into a bowl, let them cool, pound them fine, add two cupfuls boiling cream and stir well; put through a coarse strainer; add the soaked gelatine while the cream is hot; now add the beaten yolks of four eggs and one-half cup sugar; put it over the fire and cook for three minutes, remove, and let it cool. Whip one pint cream light and add it to the other ingredients when cool; pack the dish containing them in ice and whip up; when very thick pour into a mould, lined with sponge cake or lady-fingers, and set away till wanted.

Cream Mustard Eggs.—One cupful cream, two tablespoonfuls flour, one tablespoonful chopped parsley; melt the butter and mix these ingredients together; add pepper, salt and a little mustard—about a saltspoonful. Cut six hard-boiled eggs in half, take out the yolks and chop them up; add them to the cream and boil for two minutes; fill the whites with the mixture, pour the rest of the cream about them, and serve very hot.

Peach Preserves.—Pare and slice your peaches, weigh them, and to each pound of fruit allow one of sugar; put a layer of peaches in the preserving kettle, then one of sugar and so on, and let them stand over-night. Put the kettle over the fire, and as soon as the sugar is thoroughly dissolved strain out the peaches and let the syrup boil for half an hour; put in a portion of the fruit and cook it for ten minutes; take out, lay on a dish, add more, and cook again until all has been cooked ten minutes; then repeat the process, cooking the first dishful first. When they are quite tender strain out all the fruit and let the syrup boil thick; put the fruit in jars, pour in the syrup, screw on the tops, and store in a dry place.

Pineapple Fritters.—Make a batter of one and a half cupfuls sweet cream, three eggs, yolks and whites beaten separately; a little salt and enough flour to make it quite thick; cut a ripe, juicy pineapple in slices, and cover each piece with powdered sugar, and let them stand in it for three or four hours. When ready to serve dip each piece in the thick batter, and fry in very hot lard; drain the fritters on blotting paper before serving.

HYPNOTICS.

THEIR CLASSIFICATION IN REFERENCE TO THEIR APPLICATION.

Professor Germain See gives (*Med. Age*) the following classification of hypnotics, according to the cause of the insomnia:

1. Insomnia from pain: Morphine, or antipyrin, acetanilid or phenacetin; sometimes bromides. If visceral, opium or belladonna.
2. Digestive insomnia: Hot, alkaline water laxatives, regulation of digestion.
3. Vascular, cardiac and dyspnœic insomnias: Secure ventilation, relieve asthma, by iodides, ethyl or pyridin; morphine, if iodides fail. Amylen, chloralamid, and especially sulphonal, are safe; not chloral and bromides. In cardial lesions urethan and sulphonal may suffice; probably not, but they are safe. In angina they are dangerous.
4. Cerebro-spinal insomnia: Sulphonal, amylen and chloralamid can be advantageously alternated in agitated and persistent insomnias of organic diseases or insanity. Functional affections have insomnia from cerebral anæmia. Hypnotics if given, must be watched.
5. Physical insomnia: Sulphonal paraldehyde, chloral succeed best if the loss of sleep be due to worry.
6. Genito-urinary insomnia: Rare. Use iodides, cold douches, antipyrin and hypnotics rather than narcotics; with proper regimen.
7. Febrile, auto-toxic infectious insomnia: Often diagnostic. Treat cause; antipyrin in diabetes.

OYSTER STANDARD.—The Maryland oyster law provides that all oysters less than two and one-half inches long from hinge to mouth shall be returned to their natural beds. The penalty is a fine from a hundred to five hundred dollars, or sentenced to jail or House of Correction. The Baltimore Exchange will not receive oysters from violators of the laws, and appeal to the packers and dealers to lend their assistance in enforcing the law rigidly.

ACID FOR CLEANING.—An acid which seems to have a peculiar solvent action upon the oxides, and yet leaves the metallic surface intact, is oleic, and when combined with finely-powdered Venetian red and cleaning fluids, it leaves nothing to be desired in cleaning and polishing brass.

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CONTENTS.

LIVINGSTONE FORESTALLED.

A French review, *L'Exploration*, has published a remarkable work which, for the first time, gives a condensed history of the expeditions across Africa. They are sixteen in number, and the belief that Livingstone was the first European who travelled from one side of Africa to the other is erroneous. He crossed it fifty years after the Portuguese Honorato la Costa, who, from 1802 to 1811, went from Angola to Tete, on the Zambesi. Moreover, Livingstone was preceded by two other Portuguese. Francesco J. Coimbra, starting from Mozambique, succeeded in reaching Benguela, 1838–1848; Silva Porto crossed the continent from Benguela to the mouth of the Rovoumo, 1853–1856. The fourth trip across was made by Livingstone, who travelled from St. Paul de Loanda to Quillimane, 1854–1856. The fifth journey was undertaken in a different region. Led by a German, Gerhard Rohlfs, the expedition went from Tripoli, on the Mediterranean shore, to the Gulf of Guinea, near the Niger's mouth, 1865–1866. Twenty years after Livingstone, from 1873 to 1875, Lieutenant Cameron accomplished the sixth trip across Africa—from Bagamoyo to Benguela. The seventh trip, 1874–'77, which proved so fertile in regard to geological discoveries, was made by Stanley from Bagamoyo to the mouth of the Congo. The eighth, 1877–'78, was performed by a Portuguese, Major Serpa Pinto, who travelled from Benguela to Port Natal. From 1880 to 1882 the Italian explorers Matteuci and Massari started from Suakim, went through the Bornou, and stopped at the Niger's mouth after a journey of about 3,000 miles—5,000 kilometres. Between 1882 and 1884 Lieutenant Wissmann travelled from St. Paul de Loanda to Saadani on the Zanzibar coast. From 1882 to 1884 the Scotch missionary Arnat started from Port Natal and reached Benguela. The twelfth expedition, 1884–'85, was led by two Portuguese, Capello and Ivans, who crossed over from Mossamedes to Quillimane. The thirteenth, 1885–'86, made by the Swedish Lieutenant Gleerup, took the shortest time of all. The young explorer consumed only six months in going from Stanley Falls to Bagamoyo. From 1885 to 1887 Oscar Lenz, an Austrian, started from the mouth of the Congo and reached Quillimane. The fifteenth trip across Africa was the famous expedition of Stanley from the Congo's mouth to Bagamoyo. Finally the sixteenth and last journey undertaken and successfully accomplished from one side of Africa to the other was made by the French Captain Trivier, who returned this year to France. The Dark Continent has thus been traversed sixteen times. The Portuguese were the first to undertake the task, and they succeeded in five out of the sixteen expeditions. During the last ten years more journeys across Africa have been accomplished than during the eighty before, and while the first explorers took ten years to accomplish the journey, recent ones have taken only one year, and in one case six months.

A LIVELY DISSOLUTION.

The ultimate destiny of the earth is settled at last. According to Rev. J. S. Vaughan, an Episcopalian clergyman writing in the *Dublin Review*, the earth will finally go to heaven, through the "resurrection" of bodies buried in it. Mr. Vaughan's scheme is a plain one. The weight of the earth, according to the scales of science is 6,000,000,000,000,000,000,000 tons. Mr. Vaughan estimates that by the year 6,000 the population of the earth at the present rate of increase will be about 320,000,000,000,000,000. Unless every one of these people returned his body to the earth, as he truly remarks, "there would be a steady and inconvenient diminution of its bulk." As the ages go on and the dead multiply, the whole of existing matter will be absorbed by their bodies. There will be nothing except the earthly tabernacles of souls. Hence, when the last man dies, and on the final day the archangel sends forth the command to "arise and come to judgment, ye that dwell in the dust," the earth must disappear with the dead. That settles it. Thanks, awfully.

EDISON'S LATEST.

It has been observed by astronomers that the appearance of spots on the sun are coincident with meteorological phenomena, and that cyclones, tornadoes, water-spouts and earthquakes are more frequent or are coincident with the solar disturbances. It is also ascertained that these spots are the results of bodies falling into the sun, and that the disturbance affects the telegraph wires on this planet. Mr. Edison, considering all these data, has, according to current rumor, conceived an idea of marvelous enterprise. It is the project of making it possible to hear the sounds which the falling bodies make on the sun. In New Jersey there is a hill containing many tons of magnetic ore. This, it is asserted, he has encircled with many miles of wire, and he proposes, by means of electric currents, to register on this apparatus the disturbance, as the vibrations affect our atmosphere, and by connecting these wires with a gigantic phonograph to listen to the sounds that occur in the sun's atmosphere. The proposition sounds well, anyway.

WHY SOME FAIL.

The question was recently propounded by a magazine editor to two of our conspicuously successful Americans, "What are the causes of poverty?" One replied, "Ignorance and incapacity." The other said that the prevalent cause is "The number of young men who are wanting in decision and fixity of purpose. If they get into a good place at the start, they should stick to it, knowing that by perseverence, industry and ability they win promotion in due course as vacancies occur. But they see or hear of some one making a fortune in Wall Street, or in ranching, or in mining, and away they go to try their luck. When they lose, as they do in ninety-nine cases out of a hundred, that is the end of them; they can never settle down to ordinary ways of living after that, and their descent is rapid." This reason hits the nail square on the head. Go where we will, we will find men who commenced life under the most favorable circumstances, but who are such complete financial wrecks that there is but little hope for their reformation. They may be honest and temperate; they may even possess natural ability of a high order, but lacking in steadiness of purpose, they will never succeed. Had they sufficient will force to stick to one thing, no matter how disagreeable it might be at first, were they content to advance slowly, they would have no reason now to talk of the "luck" of those who have pushed forward into the front ranks. Another cause of poverty is a lack of self-confidence. Many men seem to have no faith in themselves, consequently no assert-

iveness, no independence, no pluck, and no push. They are afraid to stand up and speak for themselves, preferring to lean on others. They are afraid to make an investment, because of the possibility of failure; they are afraid to tell what they can do, as they might make an error in doing it; they are cowards in every sense of the word. This is often the result of early training. A boy, naturally timid, is kept in the background so persistently, and his mistakes are so severely criticised, that he grows up into an entirely useless man. Push and fixity of purpose will always bring a measure of success.

KOLA.

A VEGETABLE STIMULANT OF GROWING VALUE.

Mankind through all time has sought for stimulants, but what were used in earlier ages we know only from very meagre records, outside of wine and fermented drinks. It is quite certain that the aborigines of all nations were aware of the medicinal and stimulant properties of most of the plants in their vicinity. It would make an interesting book to describe all the plants used thus by various nations. Though doubtless many would be rejected, some might benefit the present generation, and be simpler and more efficacious than the deadly drugs so constantly prescribed. Nature often provides us with remedies at our doors better than those we seek with so much trouble far and wide. The one I am about to write of is well known, probably has been for centuries to many colored nations, but not much outside of them, though, from the attention it is beginning to excite among medical scientists, it may possibly play a more important part in future among the white races of the earth. The kola or cola is a large tree, native principally of Guinea, the Soudan, Mozambique, Abyssinia, and various regions in India. It is a *Sterculia*, and the seeds of two species, the *acuminata* and *tomentosa*, go by the name of kola nuts. There are two trees in the Brazils with fruit of the same name, the *S. chica* and *S. lasiantha*. The Asiatic ones are of several species, but I only know of the *S. nobilis*. The whole family of the *Sterculiads* contain much mucilage, and many of the trees and plants are very valuable, the leaves, bark, fruit, and seeds being used as medicinal agents in different parts of the world. All contain a fixed oil which can be burned in lamps. The fibres of some are made into cordage, and others serve in the weaving of cloth. There is only one I know of in North America, the *S. plantifolia*, introduced into the Southern States from China and Japan. In the Soudan the name kola changes to *jaru*. The nuts are very extensively used and very highly valued by various African tribes, who chew them for their agreeable effect upon the system, their peculiar properties in causing wakefulness, and their general stimulating results. They are said to contain no tannin, and in this respect differ from caffeine. In form they are rounded, compressed, somewhat resembling the European chestnut, and of a bitter taste. It is affirmed that the kola has the power of arousing persons from their maudlin and idiotic condition when suffering from intemperance, and is used by the natives of Mozambique to cure drunkenness. (Pity it could not be applied here for the same purpose.) In many parts of Africa, where water is scarce and the supply is impure from any cause, the natives are said to purify it with kola. Some experiments have been made recently by scientists in the old world, and particularly by Professor Haeckel, of Marseilles, showing that the kola nut possesses extraordinary stimulating powers. He states that the colonel of a regiment at Perpignan dosed with kola made the ascent of the Canigou Mountain, 9,137 feet, and felt quite fresh after his twelve hours' climb. He only halted once for twenty minutes, and ate nothing. The One Hundred and Twenty-fourth French regiment, by means of kola, marched for fifteen and a half hours, from Laval to Rennes, a distance of forty-five miles, or at the rate of three and three-quarters of a mile an hour, and were fresh at the finish. Kola is said to have the same effect on horses. Professor Haeckel urges the use of kola instead of caffeine for a muscle bracer. It is also stated that the members of a certain Alpine club who perform unusual mountaineering feats without experiencing any fatigue employ it in the preparation of their food. Possibly the members of all our athletic and baseball clubs might benefit by the use of the nut in their long and fatiguing sports. Many a good game has been lost from breaking down of the players when under unusual strain. Surgeon Hamilton, R. N., appears to have found a use for the kola, which, if it is really a fact, will prove a "boon and a blessing to man" and woman also. He says that he has tried it in cases of sea-sickness, and in many instances there was complete relief from nausea in about forty minutes from chewing fifty to sixty grains of kola seed; but it must be good and fresh. Is not this grand news for all those "who go down to the sea in ships," and who have to pay a severe penalty when they invade old Neptune's domains? During my visit to the Seychelles Islands, when on an excursion to the Black Forest, in the Island of Mahe, I had an opportunity of seeing the stimulating powers of kola tested. The Morne Blanc Mountain is the highest in the island, and rises over 2,000 feet above sea level. This elevation is not great for a mountain climb, but the difficulties of the ascent made it equal to one of double the height. My Scotch friend and myself, laden with our vasculums and other impedimenta, had all we could do to surmount the obstacles in our way. It was steep and rugged for a good way up, but when we came to sheer masses of rock, often a hundred feet high, with only a foothold in the numerous interstices or up the crossed slopes of the great lianes that covered the boulders, it was no easy matter. So many ferns and other rarities grew from every crevice, which we had to snatch at haphazard, and we were thoroughly exhausted when we reached the first plateau. Our three Mozambique men, each with a heavy load on his head, had still harder work than ours. Yet, strange to say, they climbed up like monkeys, and were not half so tired as we were. After leaving the table land, we had to cut our way at every step through the jungle, with a tropical sun overhead, which made it terribly oppressive and fatiguing to us, but our men bore it well. We were so surprised that we questioned them about it. One of them spoke Portuguese fairly, so through him I could converse with all of them. They told us that the day before their departure they had prepared for the climb by having the whole body well rubbed with certain oils, and just before leaving had mixed kola seeds with their food. These men had been made slaves by the Arabs, and, after being put on board one of their dhows, they had been captured by a British man-of-war and landed at Mahe. They said the slave dealers gave the kola nuts to their prisoners on their long forced marches to the coast, as without them so many would succumb to cruel treatment and fatigue. While making a tour round Mauritius with some friends, we encamped in a forest, at a distance of sixteen miles from Port Louis. I had my photographic apparatus with me, which was carried on the head of an Indian servant. When I had finished with it I decided to send it back to Port Louis with other traps before resuming our route. I packed the whole up as compactly as possible, but it weighed full twenty-two pounds. He took his rice and curry for supper, mixing a paste with it made from kola nuts, and started off at sunset with the package on his head and a stout staff in his hand. He arrived in Port Louis at midnight, after traversing a devious road of hill and dale and swampy land. He remained long enough in the city to procure a saddle and other things for me, which took him about an hour, and he returned with them to our camp about five P. M., fresh and in good condition, and was quite willing to go back again if he got paid. He trotted most of the way, and the number of miles was not remarkable, but that it should have been traversed over rugged paths and with a heavy weight on the head. The Brazilians eat the nuts of the chica, but if with the same results as from the kola nuts I do not know. The trees and fruit of the African and Asiatic sterculias greatly resemble the chica. I will here say a few words on the areca nut, principally credited with being an intoxicant. The nuts are largely procurable from the palm *Areca catechu*, and, when mixed with lime and enfolded in the leaves of the *Chavica betle or Piper betle*, are chewed by hundreds of thousands of both men and women. All the ingredients are said to be stomachic. They stimulate the salivary glands and digestive organs, and counteract the effect of the large amount of rice they eat. The Indians tell you it preserves the teeth and gums, though it is a disgusting sight when the chewing is going on, making the gums and lips appear to be bleeding. Physicians who have resided long in India say that in the damp, pestilent regions of that country, where the natives live on miserable food, the chewing is really conducive to health. —Nicolas Pike, in *Scientific American*.

LITHIA WATER.

ITS VALUE AND EFFECT AS A THERAPEUTIC AGENT.

The different salts of lithia were prominently brought under the notice of the medical profession about thirty years ago by Dr. Garrod, a French chemist and physician of high standing, who recommended them in cases of uric acid diathesis, connected with gravel, and also in chronic gout and rheumatism. This recommendation was based upon the chemical fact that lithia possesses great affinity for uric acid, and hence when mixed with urate of soda it decomposes the latter and unites with the uric acid, forming a soluble urate of lithia and leaves the soda free. There are various derangements of the system which produce an excess of uric acid, which, if not eliminated from the blood, cause gouty deposits, gravel and a long train of symptoms pointing toward the kidneys and bladder as the seat of the disease. This production of uric acid and its various salts and their gradual deposition in the kidneys, bladder and stomach, upon the joints, and more especially those of the hands and feet, and within the terminal cells of the locomotor muscles indicate a serious derangement of the blood and the vital organs which, if not remedied in time, directly or indirectly will lead to serious if not fatal results. The unhealthful action of uric acid and the urate salts upon the body has been well described by Dr. Dowling, of New York City. "With a tonic element circulating in the fluids of the body, it is hardly to be expected that any of the organs should escape its influences; and a close study of this disease and a large ex-

perience, both in my consultation and general practice, in the investigation and treatment of lithæmia and the organic diseases resulting from it, satisfy me that such is the case. The entire nervous system is effected by the presence of this poison (lithic acid) in the blood. As was before remarked, many of the so-called cases of neurasthenia are cases of lithæmia, and can be cured by eradicating this poison from the blood; and the etiology of many cases of insanity can be cleared up by carefully considering the antecedents of the patients as regards the indiscretions of life and hereditary influences, not with special reference to insanity, but lithæmia, gout and renal and urinary calculi. It is in this vast class of ills that lithia is of incalculable benefit, by combining with the uric acid, whether combined or uncombined, and rendering it soluble and so easily expelled from the system by the aqueous element of the blood and other organic fluids; it takes away the entire cause of derangement, and so restores the sufferer to perfect health. In this respect it is far more efficient than salicylic or benzoic acid, colchicum, potassium carbonate, or any of the ancient remedies employed in such cases. A pregnant cause of lithæmic troubles is meat-eating combined with sedentary habits. The large amount of nitrogenous compounds in animal foods is more than the system requires, and when digested and thrown into the blood is bound to break down the simpler compounds, among which is invariably uric acid. If the system be alkaline at the time, urate of sodium is produced, and both begin to manifest their presence by rheumatic symptoms of some sort."

For this reason a good natural lithia is the best table water that can be imagined. It neutralizes the evil effects of animal food, cleanses the system in every cell, and withal, through its carbonic acid gas, acts as a mild stomachic and nervine. Its virtues in this regard are so great that it is bound in a few years to replace nearly all the waters now in daily use. One result of its health-giving action is worthy of notice. By restoring the tone of the urino-genital system and by improving the condition of the blood, and thus increasing the vitality of the organization, they stimulate and invigorate the generative processes to a remarkable extent. Nature thus does in a normal and healthful manner what the quack and charlatan have pretended, the physician and chemist attempted unsuccessfully to do for a hundred years. This, while of no advantage to the healthy and youthful, will be welcome news to those broken down by overwork, sedentary occupation, or chronic invalidism. A noted European lithia spring gives the following analysis:

Lithium carbonate	4.01
Aluminum sulphate	2.55
Magnesium carbonate	5.68
Iron carbonate	2.83
Calcium carbonate	4.42
Sodium chloride	3.50
Magnesium sulphate	2.19
Potassium sulphate	1.02
Silicic acid	1.83
Organic matter	traces.
	28.03

It will thus be seen that this water, in addition to the lithia it contains, is an effervescent, mild, laxative water, and therefore has all the advantages of other mineral waters, such us Apollinaris, Vichy, Seltzer and Congress, with the addition of the lithia. A late analysis of American lithia waters, made by Professor E. Waller, of the School of Mines, published in the *Journal of the American Chemical Society*, gives some facts about these waters which are rather surprising, inasmuch as they are not in accord with what has been reported hitherto regarding these waters. Samples of several lithia spring waters now on the market were analyzed. In one sample the amount of lithia found, after evaporating ten liters of water, was too small to permit of a quantitative estimation. Another sample had evidently salts added, therefore could not fairly be counted as a natural water, especially as some water bearing all the labels and marks of genuineness from the same spring had evidently not been added to, and consequently bore no trace of lithia whatever. The Buffalo Lithia Spring water was found to contain about the usual proportion that might be expected in a natural lithia water. Not wishing to make invidious comparisons here, the comparative analyses are omitted. There can be no doubt, for reasons to obvious to mention, that a natural lithia water is the one best adapted for therapeutic use, and therefore the best of these natural waters, that from the Buffalo Lithia Springs is the one to be recommended. Incidentally, it may be added that the Buffalo Lithia Springs are the only lithia springs in this country where free access is given to the public, and where thorough scientific investigation is courted.

THE SUMMER GIRL'S TRUNK.

A GLANCE AT ITS INTERESTING CONTENTS.

Did you ever, inquires a writer in the *Sun*, have a sister or sweet girl cousin or become well enough acquainted with any other fellow's sister to get a peep into the summer girl's trunk as she closes it at the end of the season? An investigation of its contents is a greater revelation to the uninitiated in woman's character as developed in the progress of the centuries by the advance of civilization than any or all of the books yet printed on the results of co-education and woman emancipation. The amount and variety of material requisite to the comfort of one woman for a few weeks astonishes the man traveler, to whom a change of linen and a night shirt are the only necessities for a journey round the world. In the first place, way down in the bottom of the trunk is a collection of shoes, each wrapped neatly in its own cover of white paper, which indicates something of the change in woman's capability for entering into the delights of country life. Instead of the assortment of frail slippers and high-heeled shoes worn in the old days when the mornings were spent in endless fancy work and gossip on the verandas, the evenings in dancing and dreaming in the moonlight, there are broad, rough-soled, sturdy boots for walking and climbing, loose tennis shoes with rubber soles, riding boots, coming up high and straight about the ankle, like a cavalier's; smart ties, the color of the sandy beaches, and the dancing slippers hidden away in a corner. Then there are the books—Browning and Spencer, Marie Bashkirtchef, and a French play and lexicon, for the summer girl invariably thinks she will improve her mind in summer, but never accomplish it unless it rains continually and there are not even small boys to flirt with. The books, except, perhaps, the newest novels, are used as ornaments about her room for the most part, unless, possibly, she reads a little in the prayer book some night after she has bidden the latest victim good-by, and promised to be a sister to him and "always interested in his success," etc. And she may read a little poetry that night, too—something from Meredith or Browning. But to return to the trunk, there is an alcohol lamp and curling tongs, if she is a wise virgin and knows that all the elements of nature—sun, wind, and dew—conspire against and unite to wreak the destruction of bangs. There's a Kodak and a banjo, possibly a little set of geological implements or a botanist's or natural history student's outfit for collecting specimens. There's a work basket, half a dozen sashes to tie on chairs, and neckties to put on vases; there are a lot of pebbles she has gathered just when words, she will not reveal, were whispered to her on a beach, and grasses, each fraught with associations, plucked on some mountain height; there are balsam buds for a pillow, photographs, and a writing pad stuffed with unanswered letters and stationery. A lot of gauze and frills are packed in, with sweet-scented sachets between and the ruffles all on the outside, as if they were on exhibition in a shop window instead of hidden away where only the girl herself sees them. There are few of the softly trailing, fragile, lacy gowns that were worn in the old helpless days of woman's subjugation. She has borrowed of her brother dreadnaught flannel and tweed, made up in simple kilted gowns, with smart braided bodices, to be worn over starched fronts, and there are unconfining skirts of flannel hanging simply from the belt, with shirts and coats or blouses for bodices; there are bewilderingly dainty, misty evening gowns, filmy, fascinating little wraps and scarfs to be worn on moonlight nights on the veranda, from beneath which bright eyes gleam with dangerously softened light; there are snug little sensible coats, very smart and mannish, rough-and-ready sailors' soft felt hats that are folded up and sat upon when out of use, and there are creams and lotions and powders without number, dumb-bells with bows on, and silken bags for dainty needlework. The wonderful thing about it is how she gets the things all packed in opposite places, with the frills to the front, and clean linen covers spread over each tier. A man's trunk is a strange jumble of rough coats packed in with silk shirts, cuffs, and boots in happy proximity, fish boxes and neckties jammed in together, and a bottle of ink or cordial gently filtering through the whole, unless some woman packs it for him; but a woman's packing is a work of art, dainty, orderly, complete, and enduring. And when the things come out of the trunk how quickly the atmosphere of the most forbidden, cheerless hotel apartment is transformed into something homelike, cheery, cosey, and feminine. If the summer girl and her trunk were landed in the solitudes of Sahara she would make more of a home in twenty-four hours with its contents than a man could make in a Fifth Avenue mansion with the city's resources at his command. To be an all-around, complete, capable summer girl, to do all the things one is expected to accomplish, and to do them admirably; to be mannish and clever, gentle and womanly, daring, yet conventional, and always bewitching, requires more apparatus, more varied accomplishments, and wiser intuitions than to fit out an arctic expedition, found a nation, or rule a people.

LABELS FOR TIN.—To make labels adhere to tin, use a freshly made solution of gum tragacanth in water.

DURABLE TIMBER.—It is claimed that timber endures better when the tree is cut during full leaf and bark removed at once.

RUSSIAN PASTEURISM.—The Russian Government has made an apppropriation of of 1,500 roubles annually for the maintenance of a Pasteur Institute in Tiflis for the cure of hydrophobia.

NEED OF AIR.—But few know, still fewer give heed to the fact that the quantity of air used daily by an adult is in volume about 3,000 times and in weight four times as much as that of other food, solid and liquid combined.

SULPHUR DISINFECTION.—Sulphur fumigation, notwithstanding some opposition on the ground of inefficacy, is still highly recommended by the best authorities as the best disinfectant, after steam, for rooms, when properly done. It has certainly a long history to back it up.

AMERICAN WATER WORKS.—It is said that the water works in the United States and Canada have about trebled in the last ten years, growing from 660 in 1881 to 1,900 to-day. The capital invested is $500,000,000, their annual revenue is $50,000,000, their mains are 30,000 miles long, and they have 2,000,000 taps.

SMOKELESS SHOOTING.—*La Nature* contains copies of two instantaneous photographs showing the difference between a volley fired with ordinary powder and with smokeless powder. The pictures were taken at the moment when the command "fire!" was given. In the first a thick black cloud of smoke is represented, through which the gunners are barely perceptible, while in the second only a thin haze is observable, which evidently would totally disappear in a second or two, and which probably would not be seen at all from a short distance. The gunners in the background are clearly and sharply defined.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

October.

MEATS.—Beef, mutton, ham, kidneys, liver, venison. sausage.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock, brant, grouse, partridge, rabbit, snipe, goose.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, pike, porgie, prawn, rockfish, salmon, sea bass, sturgeon, smelt, turtle, white fish, whiting.

VEGETABLES.—Artichokes, beets, beans, broccoli. Brussels sprouts, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, oninons, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips, water cress.

FRUITS.—Apples, bananas, blackberries, grapes, melons, oranges, peaches, pears, pineapples.

PRACTICAL RECIPES.

RENNET WINE.—Take a piece of calf rennet about three inches long, cleanse and dry it, and set it away in one pint sherry. When needed, use three tablespoonfuls to one quart milk.

RENNET CUSTARD.—One quart milk, three tablespoonfuls rennet wine, 5 teaspoonfuls sugar, nutmeg. Warm the milk, but do not let it get hot; add then the rennet; sweeten and flavor.

JUMBLES.—Beat very light one cupful butter and one and a quarter cups sugar; add three well-beaten eggs, half a grated nutmeg, one teaspoonful vanilla, and just enough flour to allow you to handle the dough. Take a piece in your fingers, roll it into a ring, lay it in a buttered pan, and when the pan is filled bake in a good oven.

PRESEVERD QUINCES.—Pare, core, and cut the fruit into round pieces, throw them into water as you cut them; take them from the water, put them in the preserving kettle, cover with boiling water, and let them cook very slowly till tender. For every two pounds quinces allow half pound sugar and the grated rind of half a lemon. Put the sugar in a kettle, over it pour one pint water to each two pounds, stir till the sugar is melted, then add the lemon rind and boil up once or twice. When the quinces are tender enough to be pierced with a straw, strain them carefully, put into the syrup, boil up, skim and can.

QUINCE JELLY.—Cut your fruit in slices, put them in a kettle, cover with cold water and boil till soft, pour into a flannel bag and drain slowly through; measure the juice, allow to each pint three-quarter pound sugar, put them together in the kettle and boil till it jellies.

APPLE JELLY.—Select good tart apples, wash and quarter them, put them in the preserving kettle, cover with cold water, cook till tender. Drain through a flannel bag without squeezing. Measure the juice, return it to the kettle, boil and skim; then for each pint of juice add two cupfuls of sugar. Drop in a few slices of lemon for a few moments to give it a flavor. Boil till it jellies, pour in tumblers and set away.

CARAWAY-SEED BISCUIT.—One pound flour, quarter pound sugar, quarter pound butter, half ounce caraway-seed, three eggs. Add the eggs, well beaten, last. Roll out and cut like biscuits, but thinner, brush with milk and sprinkle with sugar. Bake for about fifteen minutes.

STEWED LAMB WITH GREEN PEAS.—Take some thin slices of raw lamb, just cover them with beef gravy or soup, dredge with flour, pepper and salt, cook till about half done, then add a cupful or two of green peas and simmer gently till done. Serve with a garnishing of toast.

FOODS AND FEEDERS.

SOME OF THE STRANGE VAGARIES OF THE HUMAN PALATE.

Seaweed, says Dr. Crespi, is eaten on the coasts of Scotland and Ireland in vast quantities, and, though unpalatable, and flavorless, is at times the chief food of some of the poorest. When dry it is richer than oatmeal or Indian corn in nitrogenous constituents, and takes rank among the most nutritious of vegetable foods. Laver is an exception to the low estimation in which seaweed is held, and is a favorite condiment. We have known it eaten in large quantities in North Devon, and with much relish. To prepare seaweed for the table it should be steeped in water to get rid of the salt with which it is impregnated, and a little carbonate of soda removes the bitter taste, which to some palates is most disagreeable. It should then be stewed in milk or water till mucilaginous, and is best flavored with vinegar or pepper. Fungi are almost everywhere largely eaten, though in England less attention is paid to them than they deserve, and few kinds appear at table. A curious error is to suppose that fungi are eatable and toadstools poisonous; no such line of demarcation exists, nor, strictly speaking, has the name toadstool any precise meaning. Very many fungi are edible, and the common agaric usually eaten in England is not the most palatable and wholesome. Few foods are more savory, and none are greater favorites than well-cooked fungi, and the souls of vegetarians yearn for them. The most repulsive food which human beings could eat is man. Fortunately, cannibalism, although once very general, is now mainly confined to the most degraded tribes of the South Sea Islands and to some districts of Australia and Central Africa. Lindsay, of Pitscottie, relates that a man, his wife and family were burned to death on the east coast of Scotland for eating children whom they had stolen. Human flesh is said not to be unpalatable, and this is confirmed by the horrible narrative given by Lindsay. The lion is eaten by some African races, although its flesh is in small favor with them, while the Zulus find carrion so much to their liking that, according to Dr. Colenso, they apply to food teeming with large colonies of grubs the comprehensive word "uborni," which signifies, in their uncouth jargon, "great happiness." David Livingstone tells us that the aboriginal Australians and the Hottentots prefer the intestines of animals, and he adds that "it is curious that this is the part which wild animals always begin with and that it is the first choice of our men." The hippopotamus is another favorite meat of the Africans, when they catch it. Its flesh, when young, is tender and palatable, but it becomes very coarse and unpleasant with advancing years. The Abyssinians find the rhinoceros much to their liking, so they do the elephant, which is also eaten in Sumatra. Dr. Livingstone speaks of elephant's foot as excellent. "We had the foot cooked for breakfast and found it delicious. It is a whitish mass, slightly gelatinous and sweet, like marrow. A long march to prevent biliousness is a wise precaution after a feast on elephant's foot. Elephant's tongue and trunk are also good, and after long simmering much resemble the humps of a buffalo and the tongue of an ox, but all the other meat is tough, and from its peculiar flavor only to be eaten by a hungry man." The elephants eaten during the siege of Paris where said to be a great success, and the liver was pronounced finer than that of any goose or duck. The people of Zanzibar should stand high for the comprehensive character of their cuisine. Among other delicacies are a small monkey and a fruit-eating bat. Locusts are relished by the Bedouin of Mesopotamia and some other Eastern tribes; they are placed on strings and eaten on journeys with bitter and unleavened bread. The Jews, who were prohibited eating many kinds of food which our larger experience teaches are palatable and wholesome, as well as some that we do not venture to touch, were permitted to have their fill of locusts. The locust is an article of diet to this day, but only of the very poor; it is thrown into boiling water and eaten with salt. To live on locusts and wild honey conveys a more accurate picture of extreme poverty and frugality to a traveler in the East than to any one else. Locusts, however, are not always cooked; sometimes they are eaten fresh. They are said to have a strong vegetable taste, the flavor largely depending, as might be expected, on the plants on which they have been feeding. Dr. Livingstone, who showed his common sense by not being fastidious, considered them palatable when roasted. Some of the savage tribes of South America are accused of eating everything that by any possibility will support human life. Humboldt saw children drag enormous centipedes from their holes and crunch them between their teeth; but insects and their larvæ are favorite foods in many parts of the world. In the West Indies a large caterpillar, found on the palm tree, is reckoned a great delicacy—and why not, let us ask? To our civilized taste, however, carrion and bad eggs seem foods which no human being could relish. Not so—the Chinese prefer stale to fresh eggs, and the Pariahs of Hindostan fight greedily with the dogs and jackals for putrid carrion. They would relish the rousette, a kind of bat plentiful in Java, which the natives value; but although its flesh is white, delicate and tender, it generally smells strongly of musk. The Nagus also eat raw meat. Among the Greenlanders and the Esquimaux the seal is an important food, and in spite of being coarse and oily was formerly eaten in England. The porpoise was also an English dish and its liver is, when fried, still, we believe, relished by the sailors. Arctic explorers have found the walrus very palatable and it is largely consumed by the Esquimaux. The Japanese, New Zealanders and Western Australians consider the whale good eating, and the Esquimaux highly approve of blubber and get through enormous quantities. The crocodile is greedily devoured by the natives of certain districts of Africa. Its eggs in taste somewhat resemble hen's eggs, with perhaps a smack of custard. In Great Britain we find some odd foods. The hedge-hog, a favorite dish in Barbary, and not disapproved in Spain, is eaten by gypsies; squirrels, too, are occasionally cooked in this country, and are most delicious and fully as palatable as jugged hare; at any rate we have ourselves stewed them and we can testify that they are excellent. It is even said that frogs are often eaten in the north of England. In some parts of England snails are still eaten, not as ordinary articles of diet but at stated feasts. We have in bygone days, when living on the borders of the nail-making districts of Staffordshire, seen men filling paper bags with snails to make soup, and we remember being told that they were excellent eating. The English prejudice against snails is singular, since, from time immemorial, considerable quantities have been collected round London and on the Kent pastures for export to France. In the latter country there is no squeamishness; most people there only regret that snails are too expensive to be indulged in frequently. In Covent Garden the common snail often appears for sale; the purchasers, however, are almost exclusively members of the French, Austrian and Italian colonies of London.

TARRED BRICKS.—Bricks impregnated with tar are said to be hard, durable, and perfectly water-proof. The process of impregnation is extremely simple—ordinary bricks, or, still better, machine brick being boiled in coal tar for twenty-four hours. Bricks thus treated are claimed to be especially well adapted for paving working-rooms, depots, etc. They are also recommended for the construction of sewers, cesspools, the insulation of foundation walls and similar purposes.

ANCIENT BEER.

GERMAN WISE MEN SAY THAT THE PHARAOHS USED TO DRINK IT.

The ancient and honorable history of beer is receiving considerable attention from German wise men just now. They have already traced it back several thousand years to authentic Egyptian records of the times of the Pharaohs, and have incidentally discovered new proof that there is nothing new under the sun, even in beer drinking. The most ancient kind of Egyptian beer was brewed from barley, and was called "hag." It could not have been so very bad, for Egyptian manuscripts say it was drunk as freely by the budding Pharaohs and their friends as by the common people. Even the priests of hundred-portalled Thebes were supposed after death to drink it with their roast goose in heaven. The most famous beer city, the Pilsen or Munich of the Egypt of the Rameses, was Pelusium. In Alexandria, too, however, great quantities of beer were brewed, which goes to prove that German civilization was not the first to discover the close relationship between malt liquors and learning. Conclusive evidence on this point is given by a papyrus manuscript, in which Prof. Lauth has recently found the text of a temperance curtain lecture delivered by an Alexandrian professor named Amenemann to Petaur, a student. "I have heard," said the professor of the long gone age, "that you neglect your studies to go from beer room to beer room. Now I tell you whoever drinks beer is disgusting. The odor of beer drives people away from you and callouses your soul. You delight then to run against a wall and to break in a door. Your reputation is notorious; it is written on your face. Do not think of the cup any longer; forget the mug and the accursed hag. As it is you drum on your stomach daily, you stumble, you fall upon your stomach." In Strabo's time beer was called barley wine, and was drunk generally in Alexandria. The preparation of barley beer to take the place of wine was supposed to have been taught by Osiris. Several recent German writers have a theory that beer brewing was introduced into Europe from Egypt.

A STARTLING PROPOSITION.

A CHICAGO PAPER DISCOVERS CHEAP ALUMINIUM.

The Chicago *Morning News* of September 22 stated that Professor Joseph M. Hirsh, of Chicago, has exhibited to one of its reporters the process by which he is enabled to extract aluminium from clay at a cost of only a few cents per pound, and declares that the process is entirely different from any known to the books. The announcement of this discovery was made some time ago, with the result that he was attacked as a fraud. Since the first announcement of the discovery was made Professor Hirsh has been quietly completing his arrangements to begin active operations. He has leased two five-story buildings. He claims to have manufactured 2,000 pounds of aluminium already, and within a few days the works will have a capacity of this amount every week. A reporter called on the chemist on Saturday to ask him in regard to certain charges made by a New York mining journal that he had no new process and that he was infringing on the Hall or Cowles patent, or else exhibiting metal that he had bought in quantities. "I have solved the problem of extracting the metal from an aqueous solution," said the Professor, "and the process has been so simplified that it is surprisingly cheap and requires but little labor. Pure kaolin or clay contains 33 per cent. of aluminium. From the clay I am using I can get 16½ per cent. metal—that is, from two barrels or 600 pounds of clay I can get 100 pounds of aluminium. Professor Richards, of Lehigh University, in his new work on aluminium, intimates that the metal cannot be extracted from clay in the manner that I have done it. It will take me only

a few minutes to demonstrate to you that my invention is bona fide. I will show you through the works." After promising not to publish the details of the method, the reporter was taken to the factory, and there was shown the manner in which Professor Hirsh's discovery is operated. Without going into details it may be said that the process is entirely different from any mentioned in works on chemistry, and is very clearly no infringement of the Cleveland or Pittsburg patents. "And you still say you can produce the metal for fifteen cents a pound?" "For much less than that. If I complete my arrangements for cheap power, I can reduce the labor to such a small item that the metal will cost only a few cents a pound. Of course the aluminium will be sold at the present market price for a time, as it will be impossible to turn out a big supply all at once. First the metal will be made up into articles common to Britannia-ware. Machines for spinning metal can be procured at once, and by making up this line of goods we will be able to get $8 or $10 a pound. Afterward we can turn out greater amounts, and will manufacture a variety of articles or sell the metal in bricks or sheets. It will be a long time before the metal will be produced in such quantities as to warrant its use in building houses, cars or vessels, although the inventor of the Thomson patent car has already arranged to construct four sleepers of aluminium for the Baltimore and Ohio Railroad Company."

THE LABORATORY.

VALUE OF ITS ACHIEVEMENT TO THE MEDICAL PROFESSION.

To the members of the learned profession in this and other countries there have been no circumstances more remarkable than the developments made in the field of medicine through research conducted in the chemical laboratory. That the scientific combination of certain articles, with which the physician and chemist have long been familiarly acquainted, should produce entirely new and powerful remedial agents, as antipyrin, cocaine, acetanilid, and many other additions to the list of prophylactic and therapeutic agents, displays the value of careful and intelligent investigation. Through the unwearying efforts of the chemist, the medical practitioner has been thus thoroughly equipped with the most effective means to combat disease and check its progress. The old mode of depleting the system and reducing the strength to stay disease and restore health has been abolished, and with this has vanished many of the plans of treatment so commonly resorted to in the past. When the physician is called in the strength and general tone of the patient is already weakened, and a first consideration then is how to restore a healthful condition by assisting the forces of nature. Within the entire range of medicine there has not been a single instance where the remedial value of an article has been so greatly increased as in the case of Cod Liver Oil, which for over two hundred years has been among the most esteemed remedies of the Materia Medica. The idea of preparing this medicine so as to secure its greatest remedial effect, so that it may operate not only as a medicine, but at the same time furnish the nourishment that nature demands, was never fully appreciated until Messrs. Scott & Bowne, chemists, of New York, made the subject a special study, and brought to bear upon it the knowledge and experience which for many years they have applied to this particular department of medicine. Procuring the finest quality of Norway Cod Liver Oil, they have combined it with other valuable medicines in such a manner as to greatly improve the remedial value of each, and offer in Scott's Emulsion a preparation so important in restoring the injured health of those suffering from scrofulous or consumptive diseases. The medical profession has recognized the value of this preparation, and has not been slow in acknowledging its importance in the treatment of both children and adults when affected with disorders of a pulmonary character, with tendency to hemorrhage, loss of appetite, and especially when attended with emaciation.

BUSINESS NOTES.

THE GREAT AMERICAN TEA COMPANY,

31 and 33 Vesey Street, New York, whose advertisement appears in our columns, is the oldest, largest, best, and most responsible tea house in the business. They have been before the people of this country for the past thirty years, and to-day stand pre-eminent in the business of supplying consumers direct with pure goods only. We advise all our patrons and friends to give their goods a trial, and we guarantee they will be more than pleased. At the same time they will have a treat, enjoying a cup of good tea or coffee. We will state here that this Company will do everything that they promise; that is how they have built up their reputation. In fact, they are headquarters in this country for Teas and Coffees, as they import direct, and thus save the profits of the middlemen.

Correct Diagnosis.—When the tongue of trade is coated; when the eyes and limbs of the clerk are dull and languid; when the raging fever tackles the empty vitals of the till; when the spider roots in the cash box and bouquets of decay are on the chandelier, it is conclusive that the advertising doctor has not been consulted.

Remarkable Freshness.—At the depth of twenty-one feet below the surface, when digging for the Manchester ship canal, a bed of leaves was discovered which still retained a green appearance, although they must have been buried certainly for some centuries. The coloring matter was examined and found to be modified chlorophyll, resulting from the action of acids on true chlorophyll.

Boric Acid.—The German government has forbidden contractors to supply the navy with preserved articles of food containing boric acid. This order is the result of the trial of a new preservative composed of equal parts of borax and salt, which has been sold as harmless. It was found, it is said, that persons partaking of meat preserved with this agent experienced gastric derangements.

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CONTENTS.

TEA AND NONSENSE.

Is it possible that tea will not be entitled in the future to be described as the cup that cheers but not inebriates? The magnates of the tea trade in London, who practically control the entire export from China, Japan and India, have decreed that the leaf is henceforth to be blended with hops, much in the same manner in which chicory is frequently blended with coffee. Tea thus adulterated with the plant that supplies the head to beer would necessarily develop into an intoxicant, and as such disappear from the list of temperance drinks. Such a blending would likewise necessitate on the part of the Anglican Bishop of Hong Kong a modification of his recent pastoral decree in which he instructs his clergy to use tea instead of wine in the celebration of the communion, on the ground that it is of a less intoxicating nature, and that "if the Saviour had appeared in China instead of Palestine, he would certainly have selected tea for the Holy Sacrament instead of the juice of the grape."

The above effusion is from the editorial columns of the New York *Tribune* of September 26. It is a fair illustration of the reckless manner in which the average newspaper writer undertakes to grapple with technical subjects that he knows nothing about. As a matter of fact, no quainter farrago of nonsense and ignorance could have been penned. In the first place, the London tea trade controls only the Indian output, and not the Chinese and Japanese. Secondly, hops do not give a head to beer, and, thirdly, hops do not produce alcohol in the brewing process, and therefore cannot intoxicate. That effect is produced by fermentation, whereby the starch in the malt is converted into sugar and the sugar into alcohol. If the intellectual scribe who wrote the above will visit any brewery, he will be astonished to learn that hops are employed to give a flavor to fermented liquors, and for no other purpose. If he then has sufficient energy to consult a good text-book of chemistry, he will find that the principle of hops, lupuline, is a mild sedative. The tea-drinking community need not feel apprehensive of degenerating into drunkenness so long as they adhere to that beverage.

CONCERNING EGGS.

There were imported into the United States during the year ending June 30, 1889, eggs to the amount of 15,918,859 dozen, and during the year just ended 15,062,796. According to the *Commercial Bulletin*, from which we obtain the facts and figures in this article, the amounts named represent about a fair average for several years. The exports for the same time were 380,884 dozen for last year and 548,750 dozen for the year just closed. By far the greater part of these imported eggs came from Canada, last year the amount being 15,369,086 dozen, while Belgium, Denmark and Germany sent 365,469, and China 126,300. It is a curious fact that the arrivals of eggs at San Francisco exactly corresponded with the above number, which would seem to indicate that the Chinese population delight in eggs from their own far country, albeit the product might survive its usefulness under the long sea voyage. Of the imported eggs, about one-half were entered at Buffalo and Niagara, and most of the remainder on the St. Lawrence, Vermont and Eastern frontier. Of the eggs exported, 411,331 dozen went to Canada and were mostly transferred at Detroit and Puget Sound, with a fair show at Huron, in Minnesota and New York. There is a generous import of eggs at Ogdensburg, and once a week an egg train sets out for New England, gathering up the import sent in at other Northern frontier ports and distributing it widely. All along the Canada railway lines may be seen the egg boxes bearing the familiar marks of far distant New England towns. The egg is a product of a very widely scattered culture. It is well known that the rearing of poultry in large "flocks" is hazardous and not profitable, and the little farmers and householders of the whole country turn out their weekly dole of eggs that in the aggregate maintain a steady supply, and at very regular prices, for all the great cities of Europe and the United States. By the census of 1880 there were 125,507,000 fowls of all kinds in the United States, and they produced 457,000,000 dozen eggs. Add the import and it is found that the average to the population was 111, or a little over nine dozen. As many millions of these eggs were organized into resulting broilers, etc., the average of egg consumption will, of course, be reduced. By the same token, applying these proportions to Great Britain, we find that the production of eggs in the United Kingdom is 75,000,000 dozen, the imports 110,000,000, and, calling the population 35,000,000, the average consumption is 51 per annum, subject to the deduction for the eggs that enter into consumption for the production of new chickens. Ireland has almost one half (15,000,000 out of 31,000,000) of all the fowls of the United Kingdom, with about one-seventh of the population. The production of eggs depends upon accessibility to markets, to careful culture and good food. In New England, the average production to a fowl is 80 eggs. New York, Pennsylvania, Illinois and Ohio average 60. In some of the Southern States the average is 40. The egg interest, albeit among the minor industries of the country, enters largely into the domestic life of the people.

CONTAMINATED ROPES.

Every housekeeper probably has noticed how rapidly wire-ropes and wires have taken the place of the hemp and cotton ropes once so much in vogue. In speaking upon the subject to a representative of the AMERICAN ANALYST, Mr. William Van Ingen, of the great house of Roebling & Co., said: "The greatest friend of the wire rope manufacturer is the humble but terrifying *cimex*. It is not so long ago that the majority of beds were corded; nowadays they are provided with wire mattresses. Not only this, but there are wire pillows, wire bolsters, wire cushions and wire upholstery lining. The reason of the innovation lies in the fact that wire offers no breeding ground for vermin or for disease germs. Rope does, and is therefore feared by the housekeeper. The same change is now taking place in respect to clothes-lines. A few years since it was found that the old-fashioned ropes harbored minute life, and in some instances was infested with the spores of scarlet fever, croup and small-pox. The moment the discovery was made public, there was a rush for wire clothes-lines. In 1860 there was not one yard of it in use; to-day there are thousands of miles employed. Similar causes have led to the substitution of wire rope and chains for sash-cords. The changes have injured the prosperity of the little insect in question, but have been a god-send to the makers of wire and its products."

ELECTRIC RECORDERS.

In a large publishing house in Elgin, Ill., a new use has been found for electricity. In the superintendent's office ten electric lamps are arranged in separate compartments of a frame or box, somewhat similar in appearance to the annunciators seen in hotel offices. The lamps are concealed from view, apertures in front of the compartments being covered with colored glass, each having its distinguishing color. The lamps are connected by means of electric wires with the automatic counting machines on the ten large printing presses located in an adjoining building. When the presses are in operation, the electric circuit is opened and closed by the working of the counting machines, causing quick flashes of light in the lamps. Thus every sheet of paper printed in the establishment telegraphs its record to the office, where the operation of each machine can be seen and its speed or delays noted. In this connection it may be interesting to note that the speed of the large perfecting press is so great that it was found necessary to record each two sheets printed instead of single sheets, and even then the flashes of its lamp are almost continuous in appearance, showing that while the press is not quite as quick as lightning, it is too fast for the eye to follow. It is believed that this is the first application of electricity to purposes of this kind, and may serve as a valuable hint to managers of large establishments who wish to be enabled to see the operation of their machinery while working at their desks.

INDIAN CORN ABROAD.

A PRACTICAL EFFORT TO POPULARIZE ITS USE IN GREAT BRITAIN.

At the local fairs and exhibitions that are now being held or that have lately been held in various British cities, American Indian corn has been put on show in very attractive ways, and novel projects have been got up to secure its introduction as an article of diet for the use of the British people. There can be no doubt that if the efforts now being made to promote the consumption of Indian corn in Great Britain are successful, a new and profitable market for the most important crop of the United States will be established, and the prosperity of the millions of Indian corn raisers in America will be greatly increased. The State of Nebraska sent a Commissioner, Charles J. Murphy, to the Edinburgh Exposition of this year as an official representative of the corn interests of that State. Commissioner Murphy adopted plans and action in Edinburgh that soon gave promise of being far more successful than those he had been able to put in practice at the International Exposition in Paris. He then undertook, for the first time on foreign soil, to give practical proofs of the value of maize as food for mankind. Not only did he display before the multitudes at the Exposition the verdant stalks as they grow in American soil; not only did he give lectures for the edification of his hearers; not only did he display the corn on the cob and the corn meal from the mill; not only did he tell of the hundred ways in which it may be prepared for the table, but he also cooked the food in the presence of the public in a great variety of methods and served it at nominal prices to visitors who could be induced to try any of his preparations. A visitor under the Commissioner's direction at the Edinburgh Exhibition could munch the corn from the cob, or sup mush with milk, or enjoy corn dodgers or test the taste of popcorn; he could get baked mush, fried mush, croquettes of mush or hasty pudding; he could get hominy fried or baked, coarse or fine; he could get hominy waffles, hominy fritters, hominy muffins, hominy turnovers, hominy pudding, or baked hominy; he could get five kinds of corn bread, besides ash cakes, hoe cakes, johnny cakes, cornpone, or scones; he could get corn meal crumpets or griddle cakes, crackling bread, doughnuts, flapjacks, snappers, puffs, or gems; he could get a score of varieties of corn puddings and desserts; he could get green corn boiled or broiled, corn soup, corn chowder, corn omelet, or popcorn balls. In short, he saw with his own eyes that corn could be prepared for his consumption in more ways than there are weeks in the year. The display of corn and of the preparation of it and of the dishes made from it at the Exhibition was a revelation and a wonder to the multitude of onlookers and consumers. Few of them had previously any knowledge of its value as food for young and old, rich and poor. Very few of them had ever before tasted any of the preparations of it or possessed any idea of the nourishing and delectable nature of many of these preparations. Commissioner Murphy's practical method of commending American Indian corn to the British people, so that it shall become a staple article of food in their households, has many advantages, and there need be no doubt that its results will be made manifest as he pursues his labors from one part to another of the kingdom, as he finds opportunity at fairs or exhibitions. There is surely a growing interest here in Indian corn as a means of supplying the popular demand for cheap, wholesome, nourishing grain, and America can furnish it in any needed quantity at less than one-half the price of wheat. The Nebraska Commissioner holds that when once the people of the various countries of Europe know the real worth of Indian corn, which they have not learned since the discovery of America, there will be a prodigious demand for it, and that this will not only be advantageous to the American corn raiser, but will also aid in the re-establishment of the American commercial marine. Commissioner Murphy's lectures on this subject are full of interest and information, especially when he illustrates them with displays of practical cookery. In addressing an audience recently, he said that there are five distinct species of corn, and that at the New Orleans Exhibition there were seventy-five varieties from Nebraska. He presented scientific as well as commercial views of the corn question, showing both the nutritive qualities of the grain and the vast volume of its production, the latter being indicated by the statistics which tell that the ascertained crop of last year in the United States was 2,000,000,000 bushels, only about 4 per cent. of which was exported to foreign countries. He described how bountifully yet cheaply the people of Europe could live on this corn, which contains as much actual nourishment as the best wheaten flour, oatmeal, or any other highly farinaceous cereal. He told how largely it was consumed by the people of Mexico and of the Western States of the American Union, and advised the people of Europe to follow their example. He rose to poetic heights in quoting from Longfellow's "Hiawatha" the stanzas in which the "maize fields green and shining" are described. He said that one of the objects of his mission abroad was to endeavor to introduce the use of corn food into the armies of Europe, which would cause the saving of a fabulous amount of money annually." In truth, the Commissioner's lecture, from its opening to its close, threw new glory upon the Indian corn fields of America. "Yet," the Commissioner said, "I am no corn dealer or corn grower, have no pecuniary interest in the grain, and receive no subsidy from any quarter whatsoever. I feel that I can be of no greater service to the toiling millions of the world than by instructing them as to the best means of procuring the cheapest and most nutritious food." Commissioner Murphy has prepared a pamphlet in which he gives not only his lecture before the International Congress of Millers at Paris, but also over one hundred formulas for the preparation and cooking of corn, besides much other serious matter. There is now a growing interest in the Indian corn question in Great Britain, and some references to it have recently appeared in the papers. One of the writers on the subject argues that if there should at any time hereafter be a heavy demand for the grain in Great Britain, the supply would be obtained from the East Indies, where the ryots can raise it even more cheaply than it can be raised by the farmers in the Western States of the American Union.

ADULTERATIONS AND IMITATIONS.

THEIR MAGNITUDE AND HOW THEY ARE MADE.

A correspondent of the San Francisco *Country Merchant*, signing himself "Uncle Sam," and writing from San Bernardino, discusses the food adulteration question in the following lively and occasionally exaggerated manner:

In your "Brief Comments" column you censure a new sophistication of a most important food product recently offered to the trade, in the shape of artificially prepared "coffee beans," for the evident purpose of enabling unscrupulous dealers to reap a great percentage of profit by admixtures with the natural product. While concurring with your articles in regard to this disreputable practice, and favoring the enactment and enforcement of stringent food laws by the general government, I take this opportunity of calling the attention of conscientious merchants and manufacturers to the fact that they possess sufficient power to suppress not alone the production of the "spurious coffee bean," but also of all other food adulterations and imitations. To bring about this result requires combined and unceasing efforts in unearthing and exposing these frauds, with the aid of the representative trade journals, whose duty it would be to publish the facts and bring the matter before the public. My object is to awaken an interest amongst honest merchants, manufacturers and producers, and thus lay the foundation for a vigorous movement against this pernicious practice. The success of this movement would contribute materially toward eradicating the disastrous competition which exists in the grocery and produce trades. Nearly every manufactured commodity of the civilized world has long been subjected to various species of sophistication. Especially does this happen when an article becomes scarce and high, through failure in production or other causes. In fact, the adulteration of food products, and also their imitation by means of chemicals, has reached such a state of perfection as to render detection an impossibility even to the most expert eye and taste. Of late years fraudulent practices have made such enormous strides, especially in the United States, as to practically deprive not only the honest dealer and producer of profit on his goods, but also to almost paralyze legitimate production and manufacture. The special agent appointed by the general government states that out of a total sum of $4,500,000,000 worth of food products consumed in the United States in a year he estimates that of this sum 15 per cent., or $675,000,000, is adulterated. It is through the remarkable perfection to which the art of imitation, sophistication and adulteration has attained, assisted by the fact that the average consumer is generally ignorant of the processes, etc., employed in their proper preparation and their relative cost of production and likewise, their avaricious desire for obtaining goods at prices inconsistent with the cost of manufacture, that bring profit to the unscrupulous manufacturer or merchant. In this connection I would offer the following suggestions, which, if adopted, would aid materially in lessening, if not eradicating, this evil. I have always pursued this course with satisfactory results to my customers and correspondingly greater ones to myself, and I have full confidence that if any of your readers would pursue a similar course, that they would ever regret having spent either time or trouble so involved.

First. Let every conscientious merchant or producer, whenever an instance comes before his notice of any of these adulterations, report the circumstance to his regular trade journal, in order that the latter may expose them to the trade and thereby warn them to refrain from purchasing such goods.

Second. All distributors to consumers especially should acquire sufficient knowledge of their purchases to enable them to at once determine their purity and reliability.

Third. Having become familiar with the characteristics of the goods and the abuses they are subjected to, then, whenever any occasion arises whereby a customer's decision may be influenced to his and your mutual benefit, explain these circumstances and conditions so as to carry conviction with it.

To show the extent to which adulteration is carried, we will take an imaginary stroll up and down the store amongst stock to see just what part of it is adulterated and of what the sophistication consists. Do you see those elegantly shaped glass bottles on the upper shelf? Those with the handsomely designed lithographed labels, calling attention to the fact that they contain the finest quality of pickles. Do you see nothing wrong about them? Observe how bright green they appear. Well, this high coloring is produced by the use of sulphate of copper, one of the most dangerous metallic substances known to chemical science. French sardines I see right next on the shelf, and, as they are subject to "funny business," we will take a nearer view of them. As I thought, these are nothing but Maine herring, with the heads and parts of the tails cut off, and packed in the cans with a mixture of various oils, nothing except the can and its branding bearing any resemblance to the genuine article. Those bottles adjoining containing oil would be all right if the labels on them were changed so as to read something else except "olive oil." The majority of those flavoring extracts are not true to name. That vanilla, for instance, never had an intimate acquaintance with any vanilla pod, being compounded from a number of chemical substances. The same can be said of many other extracts. The ingredients, or at least some of them, used in their composition being chloroform, various ethers and fish oils, and acids highly detrimental to health. That brand of baking powder contains a large proportion of carbonate of ammonia — a product obtained chiefly by the decomposition of vegetable and animal matter. The brand adjoining, with which we distribute prizes in order to increase its sale, is an abominable mixture of burnt alum, hydrate of alumina sodium and starch. In the adulteration of spices the manipulator has attained a high degree of perfection. By mixing the following ingredients with a certain percentage, according to the grade of the article desired, he is able to produce an article closely resembling the simon pure product. Rice flour, cracker dust, yellow corn, turmeric aud mineral red are prominent features of the cayenne pepper often furnished to the public. Linseed cake, mustard husks, ground crackers, rice, beans, bran, yellow corn, charcoal, cocoanut and other shells, cayenne and similar substances, prevent the unscrupulous manufacturer from losing money on the pepper he sells. By mixing cereals and starch, turmeric and peas, yellow corn meal and ginger in his ground mustard, the public are enabled to secure "cheap" mustard. And by adding spent cloves, clove stems, cracker dust, ground shells, mineral color and yellow corn to allspice and ground shells, peas, starch, mustard hulls, turmeric, mineral color and cracker dust to cinnamon and cassia the compounder is able to leave enough money behind him when he dies to keep a dozen lawyers busy for a number of years after. Many fruit jellies are so in name only, no fruit entering into their composition whatever, being a combination of various artificial flavoring extracts, coloring matter, gelatine, glucose, alum and water. Glucose is substituted for sugar in the preparation of fruit preserves and similar products, and by the addition of certain flavoring and coloring matters is palmed off as the product of the busy bee, and also as sugar-honse or cane syrup. By placing cotton-seed oil, water, salt, beef and mutton tallows in a steam kettle, and then reflecting the shade of a hog into it and bring the mixture to a state of fluidity by the application of heat, an excellent article of "prime" lard is produced. To enumerate the entire list of food products, with a description of their adulterants in detail, would fill volumes.

LAND VALUES.—Land is three hundred times as valuable now as it was two hundred years ago.

BOTTLED MUSIC.

SOME RECENT REMARKABLE DEVELOPMENTS OF THE PHONOGRAPH.

A Washington correspondent of the Boston *Transcript* says: The Marine Band, which may be called the President's own, inasmuch as it supplies all the music at the White House, is rendering itself immortal just at present by having its most harmonious strains bottled in large quantities. When the performers in this wonderful band are all dead and gone, people will still be able to hear it play. Every afternoon it gives a concert in a room on E Street, below Seventh, to which no listeners are admitted save five phonographs. The instruments stand in a row on tables, and each of them is equipped with an enormous brass horn. In front of the horns the band discourses the loveliest airs in its repertoire, which are thus recorded on wax cylinders imperishably for the entertainment of people in all parts of the United States, who have simply to drop a nickel in the slot and listen to the concert. You would be very interested to see the manner in which this business of bottling music is carried on. Wizard Edison runs a music bottling factory on an extensive scale at Orange, N. J., where thousands of fresh airs are turned out on wax every month. The companies that handle his talking and singing machines in various parts of the country all do such bottling on their own account, each company having its specialty. For instance, the Washington company is making a specialty just at present of band music; the Kentucky company goes in almost exclusively for negro business—plantation dialogues, with banjo solos interspersed, and scenes on the levee—and so with the others. While the Marine Band plays into the five great horns, an expert manipulates the machines. Each phonograph being supplied with a smooth and fresh cylinder of wax, the expert in charge shouts into each horn separately the title of the piece to be played. When he has done this the electric motor is turned on again, the cylinders revolve beneath the recording needles, the band starts up at a signal, and the music pours into the big trumpets until each cylinder is as full of sound impressions as it can hold. Then the expert holds up his finger and the band comes to a full stop at the end of the next musical phrase. The five full cylinders are taken off the instruments and put aside in pasteboard boxes, and five more fresh ones are put on. After the title of the next piece has been shouted into each horn, the band starts up again at the signal and the process is repeated. Now and then, if there is a little space left at the end of the cylinders, the band indulges in a wild burst of applause, stamping and shouting in approbation of its own performance. This passes for demonstration by a suppositious audience, of course, when one hears the phonograph reproduce it. All the cylinders are tested before being sold, to make sure that they are perfect, about 10 per cent. of them being rejected as being defective. Selling at from $1 to $2 each, there is a fair profit on them, after the musical performers have been paid. They are hired just as for public playing, and at the same rates. The Marine Band makes $10 worth of cylinders every ten minutes, which mounts up during an afternoon's playing. Quartets and solos are done the same way in the evenings. The distance at which the players or singers stand from the horns depends upon the volume of sound produced. A cornet player, doing a solo, stands ten feet away, and even thus the notes are apt to be so loud and piercing to the ear, when reproduced by the phonograph, as to be positively painful. A quartet stands two feet from the horns, while a solo singer gets as close as possible. Every afternoon a big crowd gathers opposite the E Street building to listen to the concert, and the employes of the branch Census Office in the rear have made a special request that the phonograph company shall leave its back windows open, in order that they may get the benefit of the music. The darkey scene cylinders are rather a new thing, and are very entertaining, many of them. There is one called "Row at a Negro Ball," in which you hear the fiddle and the banjo, listen to the conversation of the guests, witness the progress of a quarrel over a dusky belle, and finally hear threats, accompanied by the drawing of "razzers" and a pistol shot, with the subsequent flight from the police. Another scene represents a banjo concert, interrupted by cries of "Fire!" You hear the engine pulled out, excited conversation, and the sound of horses' hoofs on the pavement. "Git up thar!" shouts the driver, the bell rings louder and louder, the whistle toots, a stream is thrown on the fire, and confusion reigns for a space, until the flames are extinguished, and the peaceful plunk-plunk of the banjos is once more heard as an accompaniment to the song, "Don't you hyar dem bells!" The vividness with which all this is rendered is positively wonderful. Real darkeys are used for the darkey scenes, and the company here has a wonderful whistler employed to do whistling solos. All the harp solos come from Iowa. In this way music of all kinds is gathered from every part of the United States. Mr. Edison is now turning out at his New Jersey factory the first batches of the phonograph cylinders for mailing purposes. Already ordinary phonograph cylinders are sent by post to a considerable extent by people who have machines and who like to hear each other's voices in correspondence. But these cylinders of the common sort are too large for convenience, and require several postage stamps each, going necessarily as first-class matter, like any other letters. The mailing cylinders, however, are such little things—only about 3 inches long by two-thirds of an inch in diameter—that one of them, enclosed in its pasteboard case, only takes one two-cent stamp to carry it as far as San Francisco from Washington. The case itself is cylindrical, with a cotton pad at each end, and also at each end a round wooden projection fitting into the end of the cylinder, so that the outside of the latter does not come into contact at all with the interior of the mailing case. Such a mailing case will serve to carry very many cylinders before it wears out. One of its ends screws on, so that it is something like a bottle. The Wizard believes that the most important use of the phonograph in the future will be for epistolary purposes, phonograms being sent by mail instead of letters. Each of these little mailing cylinders can be peeled, thin as it is, half a dozen times by the usual attachment of the phonograph for that purpose. It costs only three cents to begin with, and you can hardly get note paper for less than half a cent a sheet. The cost of the necessary mailing cases will not exceed that of envelopes in practice. Mr. Edison thinks that eventually newspapers will be set up by a combination of the phonograph and type-setting machine. Editors will read off into phonographs all the copy brought in, editing the copy as they go along by changing it to suit themselves in the reading, and by mentioning the punctuation marks, the paragraphs and the capital letters. The compositor will put the cylinder with his "take" on another phonograph, and, listening to the dictation from the machine, will translate it directly into type by the keys of the piano-like mechanical type-setter.

POSTING FLOWERS.—To send flower buds by post, cut a potato into two pieces, bore holes into them, and insert the stems of the buds, with cotton to support them. There is sufficient moisture in a good-sized potato to support a flower for two weeks in a moderately cool temperature. Flowers from bouquets or baskets may be preserved in the same way. The potatoes can be hidden by leaves or moss.

CRUSHED STEEL.—Crushed steel is said to be coming into use for cutting stone. It appears to be made by quenching very high-carbon steel in cold water from an excessively high temperature, such as would overheat steel for most purposes. This renders it not only hard, but rather brittle, so that it is possible to pulverize it. It is crushed in a stamp mill, and sifted closely to size. It is said to be not only cheaper but in more effective than emery, giving a better and quicker polish, and lasting much longer.

BOOK INFECTION.

PUBLIC LIBRARIES AS DISSEMINATORS OF DISEASE.

Books may be dangerous to morals, as tending to corrupt them; to intellects, as filling them with false or visionary ideas; to physical health, either because inculcating incorrect notions with regard to caring for it, or causing us to spend too much time in sedentary pursuits. Another way, however, has been discovered in which books may be a menace. A correspondent, some months since, wrote to a London paper in relation to a case of scarlet fever, which, he claimed, was induced by disease germs conveyed in a book taken from a free library, the book having previously been used by a patient ill with that disease. He urged that the class of people who most use books from the free libraries is precisely the class that is likely to employ books most when ill, and that a book may be drawn out and taken into a house free from disease, but before the time comes for returning it, some contagious disease may break out, and so the book becomes infected—the conclusion being drawn that free libraries should be banished from society. This charge against books is not new. Almost every week reports come in from some point of a new vehicle having been discovered for the conveyance of microbes. When it was bank bills, circulating as they do from hand to hand indiscriminately throughout the community, and especially when old, greasy, crumpled and "fuzzy," apparently offering a ready lodgment and facilities for preservation to germs, all could see the danger; and many doubtless made a mental resolve never to touch a bank note with their lips and to be cautious about handling one with moist hands. When, however, hard coins were declared to be in like manner infected, people were inclined to look a little incredulous. And when told for one to leave his boots in his sleeping room was "fatal to health," on account of the bacilli contained therein, they felt that they must draw the line somewhere and take a few chances in dodging death's "icy hand." The feeling among ordinary lay and unscientific people on reading these successive announcements of this sort doubtless is that it will soon be shown they cannot turn around or draw a breath without imperilling their lives, and the best way is to throw the entire matter off their minds. Fear prejudices health, and equanimity is certainly better than over-carefulness or fussiness; the latter is, in itself, unsanitary. Still it cannot be denied that it is well for all to know what is being discovered, and for Science to pursue her investigations and to publish the results. With regard to disease germs being conveyed in books, such is, no doubt, the fact. Public library books pass through the hands of those who are perhaps especially exposed to contagious diseases, and are certainly especially likely to be ignorant of the proper means to take to prevent their spread. Dog's-eared, and dirty oftentimes, covered too for protection with a rough and folded paper wrapper, the whole presenting various crevices, corners and "pockets" —a circulating library book furnishes an admirable lodging place for disease germs. It would be well for those who use such books, for sanitary reasons, if for none other, to avoid the disagreeable habit of wetting the thumb and finger in the mouth for the purpose of turning the leaves. In this way germs may easily be transferred from a book to the mouth, while, moreover, dry hands might innocuously come in contact with germs attached to a book which would fasten upon moist ones. Indeed, it is not impossible that one might read an infected book through unharmed so long as his hands remained dry. There certainly ought to be a penalty fixed for the person who draws out a library book and takes it into a house holding a patient ill with contagious diseases. And when a disease of that class breaks out in a home, if there is a library book there the fact should be reported to the librarian. He should then issue printed directions as to the proper method of disinfecting such book, and satisfy himself that it has been carefully disinfected before he allows it to be returned. It would be no hardship to meet this requirement. Let failures to comply with it be under the law a misdemeanor. With the proper authorities on the alert to rigorously proceed against every offender, and the danger from infection by library books will be very slight indeed. But even in the present condition of things, to say, as some do, that because of the danger of infection public libraries should be abolished, is going altogether too far. The danger of course varies in degree with the degree of cleanliness and education of different communities. As we have just shown, however, every reader will not be infected even by an infected book, and even if infected, he will not necessarily die or infect others. In general, the danger, though real, is comparatively small. To affirm that on account of it the multitude should be deprived of the benefits which benevolent hearts have planned for them, to establish which large sums of money have been paid out, and which are rightly deemed to be one of the greatest privileges and one of the crowning merits of our civilization, is taking a step backward. Shut off from the benefits of free and circulating libraries, inestimable as they are to those of small means, such persons must inevitably lose one of the most highly prized solaces of their lives and their best chances of becoming the intelligent citizens that by means of their aid they now often become. Any endeavor to have public libraries discarded on account of the risk of infection attached to them, slight as this risk is, is an over-zealous endeavor towards preserving life at the cost of what goes far towards making life worth having. It is by no means certain, even, that physical integrity is the most desirable possession, if it must be that of the mere savage or animal.—*Boston Journal of Health.*

BEEF POISONING.

EVIL EFFECTS OF BRUTAL HANDLING BEFORE SLAUGHTERING.

Some time in the summer of 1885 there occurred at Momence (Kankakee County, Ill.) numerous cases of poisoning, several of them with a fatal termination, which were traced to the use of dried or "jerked" beef, purchased from a certain Chicago packing house. Again, in 1887, at Columbus, Ohio, a similar outbreak occurred, and was traceable to a similar cause. Finally, at Jerseyville, Lick County, Ill., in 1888, similar cases of poisoning occurred, traceable in this instance to pork instead of beef. Professor H. J. Detmers, formerly of Champaign, Ill., but now of the State University, Columbus, Ohio, investigated each of these epidemics, if they may be so styled, and by means of a special technique and pure cultures succeeded in isolating a micrococcus which was found in vast abundance in the meat, and which, he satisfied himself, was the cause of the intoxication, being the producer of a ptomaine which was subsequently isolated by Professor Long, of the Chicago Medical College. In the course of the investigation of the Columbus outbreak (1887), Professor H. A. Weber, chemist of the Ohio Experimentel Agricultural Station, in testing certain solutions or preparations for tyrotoxicon (diazobenzene in combination with butyric acid, $C_6 H_5 N_2 C_4 H_7 O_2$), found that the tests prescribed for this substance by its discoverer, Professor Victor C. Vaughan, of Ann Arbor, were answered completely, but that further investigations demonstrated that butyric acid under similar circumstances gave identical results. We understand that Professor Weber is continuing his researches, and that important results are promised in this direction. Recently, in conversation with Professor Detmers, we found that these subsequent investigations in the cases of poisoning from beef and other cured meats had not caused him to recede a particle from the opinions expressed in an able paper read before the American Society of Microscopists at Cleveland, viz., that the meat in every instance is that of animals that were trampled upon in transportation, or otherwise injured, and were in a dying condition when slaughtered, or which, by running, chasing, and other brutalities, were brought to a highly frenzied condition before killing. The micrococci accused as the cause or producers of the poisonous principle are incidental parasites, not always and not everywhere present. If present, for instance, in a dirty stock car, slaughter house or meat market, they would find a fertile soil in the organism of an animal whose tissues are in a bruised, congested and highly feverish condition, on the well-known principle that all, or nearly all, pathogenetic bacteria, and particularly those classed among the incidental parasites, are powerless to cause mischief unless the organism of the host offers suitable conditions for their development and propagation. This theory also explains the fact that the flesh of an animal frenzied by pain or fright or bruised by cruelty is sometimes, but not always, poisonous. It will be noticed that the meat in at least two of the instances cited was simply "jerked" or dried, and presumably eaten uncooked. What effect thorough cooking would have upon the toxicity of such meat is not shown by the experiments, though in all probability it would remove the source of danger.—*National Druggist.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

October.

MEATS.—Beef, mutton, ham, kidneys, liver, venison, sausage.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock, brant, grouse, partridge, rabbit, snipe, goose.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, pike, porgie, prawn, rockfish, salmon, sea bass, sturgeon, smelt, turtle, white fish, whiting.

VEGETABLES. — Artichokes, beets, beans, broccoli. Brussels sprouts, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, oninons, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips, water cress.

FRUITS.—Apples, bananas, blackberries, grapes, melons, oranges, peaches, pears, pineapples.

PRACTICAL RECIPES.

TOMATO SOUP.—One pint stewed tomatoes, one small chopped onion, one pint water, a bay leaf, and one or two sprigs of parsley. Boil these ingredients together for a quarter of an hour, than strain and press through the colander, and return to the kettle with seasonings of salt, pepper and sugar. When the soup comes to the boiling point thicken with one tablespoonful of flour rubbed into one of butter. Serve with snippets of toast.

STEWED SHEEP'S TONGUES.—Let two or three sheep's tongues soak for two hours in salted water, then boil them in stock till the skin peals off readily. Take it off, let the tongues cool, slice them thin, dip them in brown sauce, sprinkle grated bread crumbs over them, pour one tablespoonful of melted butter over all and brown in the oven. Pour the brown sauce remaining about the sliced tongue and serve with bits of toast.

BROWN SAUCE.—One cup of stock, one sliced onion, one sliced carrot, a few sprigs of parsley, a clove and pepper and salt to taste. Cook these ingredients together till the vegetables are tender, then strain them out and mash through a sieve. Return to the sauce and let them get thoroughly heated.

Boston Baked Beans.—For Sunday's breakfast boil on Saturday morning one quart small white beans in two waters, until they are quite tender, but whole. Put them in the bean pot with half a pound of salt pork, one tablespoonful molasses, and very little salt. Bake all day and night in a slow oven. In the morning turn them on to a platter and serve with the pork in the centre.

Raisin Cake.—Three-quarter cup of butter, two cupfuls of powdered sugar, one cupful very rich milk, three eggs, three cupfuls of flour, two heaping teaspoonfuls of baking powder, a quarter teaspoon of salt, grated peel of a fresh lemon, one good teaspoonful of cinnamon, one-half teaspoon cloves, one-half teaspoon of nutgmeg, one pound of stoned raisins. Beat butter to a cream, add sugar, beat together till very light, add well beaten egg yolks, milk, flour in which the baking powder has been sifted, spices, salt lemon and raisins Beat till very light, then whisk the well-beaten egg whites in, and bake in two loaves for nearly an hour.

Orange Marmalade.—Wash and peel the oranges, boil the peels in just enough water to keep them from burning for several hours, cut up the oranges and squeeze the juice and pulp into the preserving kettle; drain the peel, mash through a sieve, put it with the juice, add one pound of sugar to each pint of juice, boil for one hour. By this time it should be very thick. Put it in glasses, cover with paper and set away.

Molasses Cake.—One cup of butter, one cup of sugar, two cups of molasses, one cup of cold water, four cups of flour, one teaspoonful of soda. Spices to taste. Eggs may be added if liked, but it is very good without them.

MEAT PRESERVATIVES.

SOME OF THE MOST WIDELY-USED PREPARATIONS.

According to Mr. E. Polenske, the composition of some of the preparations employed in commerce for the preservation of meat is as follows:

SOZOLITHE.

Sulphite of ammonia	37.3 per cent.
Sulphurous acid	39.7 "
Soda	21 "
Water	2 "

CONCENTRATED BERLINITE.

Crystallized borax	82.7 per cent.
Boric acid	9.8 "
Chloride of sodium	7.5 "

POECHEL BERLINITE.

Chloride of sodium	45.9 per cent.
Nitrate of potash	32.3 "
Boric acid	19.3 "
Water	2.5 "

THE "MINERVA" CHINESE PRESERVATIVE POWDER.

Chloride of sodium	25 per cent.
Boric acid	17.7 "
Sulphate of soda	38.8 "
Sulphite of soda	9.2 "
Water	9.3 "

AUSTRALIAN SALT.

Crystallized borax	94 per cent.
Chloride of sodium	5.5 "

With 0.5 per cent. of some hydrocarburet.

RUGER'S BARMENITE.

Boric acid	50 per cent.
Chloride of sodium	50 "

THE TRUE AUSTRALIAN MEAT PRESERVATIVE.

According to analyses of three specimens from different sources, this is bisulphide of lime. This is what is unwittingly employed in solutions by butchers, on summer afternoons, for painting their meat. It is sold to them under various fantastic names. The liquid is nothing but a solution of lime in sulphurous acid, and is used every day in brewing as a disinfecting agent. The bisulphite of lime, applied to meat, preserves it from the attacks of flies, and keeps it looking well. There is no danger attending the use of it, since a portion of the sulphurous acid volatilizes, and the sulphite changes into sulphate of lime, or plaster, which, as is well known, is innocuous. A simple washing, moreover, suffices to remove the sulphite completely at the moment of preparing the meat. This preservative agent is particularly valuable during the heat of summer, and the use of it can be very safely recommended. In commerce it is found in a more or less concentrated solution containing:

	No. 1.	No. 2.
Sulphite of lime	36.73	11.04 per cent.
Sulphurous acid	20 46	30.04 "

SYSTEMATIC EFFORT.

THE ADVANTAGE OF REGULARITY OF HABIT.

One of the most difficult of all minor habits to acquire, says an able writer, is that of regularity. It ranks with that of order. The natural inclination of most persons is to defer until the last possible moment, or to put off to another time, where this can possibly be done. Yet habits of regularity contribute largely to the ease and comfort of life. A person can multiply his efficiency by it. We know persons who have a multitude of duties, and perform a vast deal of work daily, who set apart certain hours for given duties, and are there at the moment and attend rigidly to what is in hand. This done, other engagements are met, each in order, and a vast deal is accomplished, not by strained exertion, but by regularity. The mind can be so trained to this that at certain hours in the day it will turn to a particular line of duty, and at other hours to other and different labors. The very diversity is restful, when attended to in regular order. But let these run together, and the duties mix, and what before was easy is now annoying and oppressive, and the exact difference between many is at this point. There are those who confuse and rush, and attempt to do several things at once, and accomplish little, while others will quietly proceed from one duty to another, and easily accomplish a vast deal of work. The difference is not in the capacity of the two, but in the regular methods of the one as compared with the irregular and confused habits of the other.

LIQUID GASES.

THEIR NATURE AND SOME OF THEIR PECULIAR PROPERTIES.

The word gas was coined by the alchemists and is probably from the German *geist* or ghost, showing the superstitious ideas which they connected with this mysterious form of matter. In a gas the molecules, or ultimate particles of matter, are at such a distance from each other that there is no mutual attraction between them, and each separate particle is free to move in any direction that external or inherent forces may impel it. It may be asked how we know that the molecules of gas are separated from each other, and why the matter of which they are composed may not be absolutely continuous. The simplest answer to this question is found in the fact that gases change their volume under varying conditions of pressure. A gas can be squeezed together, as it were, and, as we cannot conceive of the possibility of doing this with an absolutely continuous mass of matter, it must, therefore, be made up of separate particles. The nature and properties of gases have only been well understood during the present century. Atmospheric air being everywhere present was, of course, recognized from the earliest times; and, although the early chemists soon discovered other forms of gaseous matter, they did not thoroughly understand them, and their terms fixed air, dephlogisticated air, etc., showed their inclination to consider them as varieties of the most familiar form. The distinction between a gas and a vapor is not a well marked one. A gas is a form of matter which retains the gaseous form at ordinary temperatures and pressure; while a vapor is formed at a higher temperature or lower pressure, from a usually liquid or solid substance. Oxygen, for instance, is a true gas; while steam, although resembling a gas in every way, is formed from water at high temperatures, and when the temperature falls is condensed back into water again. Faraday first showed that many so called permanent gases could be changed to liquids, or even solids, by cold and pressure. By generating chlorine in a closed glass tube, he easily succeeded in changing it to a yellowish liquid, which, when the pressure was removed, returned at once to the gaseous state. Sulphurous acid, the gas formed by burning sulphur, although gaseous at the usual temperatures, is changed to a liquid at a temperature of about 0 deg. Fahr. without any increase of pressure; while carbonic dioxide requires a pressure of over 500 pounds to the square inch at a temperature of 32 deg. before it will assume the liquid form. Up to within a few years, certain gases—such as oxygen, nitrogen and hydrogen—had never been liquefied, and it was supposed that it was impossible to do so with any amount of cold or pressure that could be produced. By the aid of powerful apparatus, however, invented by Cailletet and Pictet, by which a temperature of over 200 degrees below zero, and pressure exceeding two tons to the square inch, were produced, oxygen, and finally all other gases, were liquefied, carbonic oxide being the most refractory one. When ammonia gas is exposed to a temperature of —40 deg. at the ordinary pressure of the air, or to a pressure of about 100 pounds to the square inch at the ordinary temperature, it is readily condensed to a liquid. When the pressure is removed, it returns to the gaseous state, and in so doing it absorbs a great deal of heat from the air or surrounding objects, quickly reducing their temperature many degrees below the freezing-point of water. This property is utilized in the artificial ice machines, in which liquefied ammonia is allowed to resume the gaseous condition in coils of pipe placed in a tank of strong brine in which cans of pure water are placed. The temperature of the brine is reduced far below the freezing point of the water in the cans, which is soon transformed into a solid block of ice. The short ice crop of the past winter has led to the use of so many artificial ice machines that the price of ammonia has materially risen in consequence, and unless the temperature of the ensuing season more nearly approaches the average, the demand for this most useful substance will be greater than ever.—*Popular Science News.*

A FEW WORDS ABOUT SCROFULA.

Scrofula is one of the most ancient ills known to humanity. Unlike paralysis, paresis, and scores of other diseases which have been produced by the unnatural conditions imposed by life in great cities, it is older than civilization. It is referred to in graphic terms by Latin and Greek writers in the West at least seventeen centuries ago, and by Hindoo and Chinese savants in the East hundreds of years before Christ. Catlin, the great Indian scholar, found it among many of the tribes of North America; the explorer, Stanley, noticed it at various points among the cannibals of the Congo; Stephenson commented on its ravages upon the ignorant natives of Polynesia, and Kane recognized it among the Eskimos. Its various names—scrofula, struma and king's evil—are interesting commentaries upon the ignorance of our ancestors respecting the true nature of disease. The first and second originally meant ulcerous or suppurating; the last, swollen, enlarged or sore glands. The word king's evil is said to come from the belief that a monarch could cure the ailment by the laying on of hands, although Thackeray suggests that it is derived from the fact that English kings, from their coarse modes of living, were more subject to the ill than any other class in the realm. Despite the spread of scientific truth, this erroneous view of scrofula is still very prevalent, and has given rise to the still more erroneous idea that

scrofula cannot be contracted, but that it is strictly hereditary and always incurable. The majority of people hold this opinion, and go so far as to deny that a man of healthy parents can ever have the disease. These false conceptions cannot be denounced too harshly, nor can the truth be proclaimed with too much vehemence. In the first place, scrofula is a condition of the body. The elements of this condition are impure blood and its twin consequences, a lowered vitality and unhealthy tissues and functions. When what is termed the disease appears, it is merely the condition expressing itself at one or more points. The commonest form is inflammation of the glands of the neck, which may go no further or may pass into suppuration, abscesses or ghastly sores. Other glands are similarly affected, more especially those under the arms, in the sides and in the groins. Those of the neck are the more susceptible on account of their exposure to atmospheric changes. Another common form consists of ulcers on the body and limbs, though seldom upon the face. Other forms are unpleasant and painful eruptions, tumors and internal inflammations. More serious are those cases in which a scrofulous subject is suffering from a wound, burn or cold, or from some ordinary ailment. Here, in some instances, the raw surfaces refuse to heal, and become angry and ulcerated; in others a simple sickness takes on a typhoid form and baffles all medical skill. There is no limit to the ravages of scrofula in these fields. In the second place, scrofula, while inheritable, is easily produced by neglect, vicious habits and wrong living. In fact, more cases arise from the latter than the former cause. Any one can contract scrofula, no matter how sound and vigorous he and his parents may be, by following these directions: Live in an ill-ventilated, foul-smelling tenement house; use a badly cooked and greasy diet; avoid bathing, exercise and hard work, and lead an immoral and drunken life. Any one, under such circumstances, is bound to become scrofulous. This is why so many seamstresses, clothing makers, embroiderers, cellar and basement dwellers suffer from the disease, and also why it breaks out into such hideous forms in workhouses, jails, army prisons and correctional institutions. Fortunately for humanity, scrofula has lost its terrors. It is easily remedied in its passive as well as its active state. The thing to be done is to increase the vitality and restore the diseased tissues to health. This can be best effected by purifying the blood with Ayer's Sarsaparilla, the most powerful remedy known to medical science, and thus expelling or destroying all the humors of the system. It is not an easy nor a speedy operation, when the disease is of long standing, and the physical being reduced to a mere wreck. In such a case, time and patience are requisite. In all other cases Ayer's Sarsaparilla effects a prompt and thorough cure, and make the despairing invalid an ideal of health and vigor.

BUSINESS NOTES.

SURA CURA.

We do not know of a more efficient remedy than Robinson's Sura Cura for the cure of rheumatism, neuralgia, sick headache, malaria. Persons predisposed to rheumatism or neuralgia, or whose blood is sluggish or impure, as evidenced by the appearance of pimples, boils or roughness of the skin, or who are exposed to the influences of malaria, can usually fortify themselves against these enemies to health by an occasional small dose of Robinson's Sura Cura, which, acting as a perfect blood purifier, removes the food that these diseases feed upon.

TWO LONG-NEEDED DEVICES.

Among the most useful household requisites is the Davis Shade Adjuster, which will immediately place shade and roller where desired on window. It enables one to control the light and ventilation of the window, because it places the shade and roller at any part of the window desired. The superabundance of cords in all devices heretofore used made them impracticable. The Adjuster is a small, nickel-plated rod, attached by screws to the top of window casing, and having across it at right angles a polished wood slat. The adjustable roller brackets are fastened to this slat with one screw in each By a very ingenious pendent the slat and roller is secured in any position on central rod as firmly as if the brackets were fastened the usual way to top of window. It can be put on by any one to old as well as new shades in a few minutes, and is for sale at very low prices by all hardware and house-furnishing dealers. It is manufactured by Stewart Hartshorn, the manufacturer of the celebrated patent shade rollers, of Newark, N. J., and Muskegon, Mich. Another very useful device of this kind, by the same manufacturer, is the Hartshorn's Shade Clasp, which is made of thin and finely-tempered steel, and allows the shade to roll close and even. This is the only shade clasp ever put upon the market that has been a thorough success. A fair trial will convince the most skeptical of their usefulness.

JAMS AND PRESERVES.

Experience is the best teacher. That being admitted, let us suppose a person who thoroughly understands fruits, and how to select the best, watching the markets daily to pick out the very choicest and those which are most adapted for preserving, with plenty of ready money with which to buy them. Now, if this person also knows the most suitable way of preserving fruits and making jams, with every facility in the way of paring, cleaning, washing, cooking, sweetening and potting, and we know that they are absolutely clean, would we not conclude that we could buy the best preserves and jams from them at a lower price than we could make it ourselves. This is just the case when we buy the goods bearing the well-known trade-mark of Gordon & Dilworth.

HORSFORD'S ACID PHOSPHATE

Imparts new energy to the brain, giving the feeling and sense of increased intellectual power. A brain and nerve food, for lecturers, teachers, students, clergymen, lawyers, and brain-workers generally. Dr. I. R. Sanford, Sheffield, Mass., says: "Most excellent in derangements of the nervous system, such as headache and sleeplessness." Dr. John J. Caldwell, Baltimore, Md., says: "It has proven by experiment and experience to be highly beneficial in inebriety and mental troubles."

Curious Custom.—In Brittany, a curious matrimonial custom prevails. On certain fete days, the young ladies appear in red petticoats, with white or yellow borders around them. The number of borders denotes the portion the father is willing to give his daughter. Each white band, representing silver, denotes one hundred francs per annum, and each yellow band denotes gold and betokens one thousand francs a year. Thus a young man who sees a face that pleases him has only to glance at the trimmings of the petticoats to learn what amount accompanies the wearer.

AMERICAN ANALYST

A Popular Weekly Analysis, for the Family and Consumer, of Everything Relating to Man's Physical Need and Comfort.

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CONTENTS.

CALIFORNIA PRUNES FROM FRANCE.

The amusing fact has recently come to light that French merchants are putting up prunes in packages labelled "California Prunes." The tables are apparently turning. It is only within a couple of years that California prunes have been offered for Eastern consumption. But so popular have they become with housewives that a struggle is going on between California and France for the American market. So warm has the contest become that, it is alleged, the wily Frenchman now sends to us the product of his orchards put up in the most attractive packages, which bear all the appearance of fancy brands of the genuine California article. It is a cheering thought that European manufacturers are beginning to find it necessary to mark their goods with an American brand in order to make them sell among Americans. It has too long been thought necessary for Americans to brand their goods with foreign labels. At this rate we may expect to see French wines seeking popularity by the adoption of the labels of California vintages. The wholesome ultimate outgrowth of the whole matter will be that Americans will learn in time to give the preference when practicable to American goods, and abandon the toadyish notion that superior quality must necessarily attach to things of foreign manufacture.

TRANSPLANTED CAPITAL.

Among the large cities of the world, London is preeminently the great financial centre, where commercial companies can be readily organized and responsible enterprises always find eager investors. In illustration of the vast number of companies being constantly formed, official figures show that in London alone in a single month no fewer than 243 were registered. This is called company promoting. The companies thus formed include all kinds of industrial enterprises, such as mines, trusts, railroads, horse cars, hotels, breweries, tobacco warehouses, distilleries, stove foundries and machine shops, and come from all parts of the globe. Of course all sorts of schemes are offered for investments, the majority being mere attempts to allure investments which naturally have little chance, as the great bankers and promoters will accept the responsibility only after the closest scrutiny and investigation, and the smaller ones dare not, if they were so inclined, endanger their reputations. The Rothschilds, Barings, Brown Brothers, and similar houses can do almost anything in the way of finding money, but it must be a genuine article they deal in. Let one of these offer subscriptions to the public for a new company, and at the day and hour appointed the street in front of their office will be crowded hours beforehand by investors, their doors besieged, and the capital subscribed perhaps twenty times over. Perhaps it may not be so readily understood how it is that companies can be so easily formed in London and the public so eager to invest. The explanation lies in the great and constant accumulation of idle funds in that centre, and the fact that, under a law of Parliament, entitled the Limited Liability Act, stockholders are liable for only the amount of their subscriptions, and no further calls can be made upon them. If the money is lost, that is the end of it, and the worst is known at the time of subscription. The result of this act is that almost every English business house of any standing is under the Limited Liability Act, and even merchants in a small way avail themselves of it, so as not to be liable for the neglect or dishonesty of partners. All private funds or property outside of that invested in the business is absolutely safe against the company's liabilities. No enterprises for capitalization can come into the London market from the United States or elsewhere which are not worth intrinsically $500,000 or more. The expenses of underwriting and advertising are necessarily large, and involve quite as much in a small as in a large company. Then, too, they should be in active operation, and able to show a net average profit for the last three years of at least twelve per cent. per annum. Prospective values in the way of new improvements, new railways, or new surroundings are not taken into practical account. Full details of every kind must be submitted, and photographs of the properties in their busiest workings should also accompany them. If the enterprise is considered feasible, experts will visit the properties to confirm the papers and report to the promoter. Capable parties in the United States who have the necessary acquaintances and connections in the financial centres of England can assist materially in placing American enterprises on the English market. The capital stock is usually divided into three classes, viz.: debentures, bearing a uniform rate of six or seven per cent.; preferred stock, eight per cent.; and common, to which is applied the surplus earnings after expenses are paid. It greatly facilitates the negotiations for the vendors to take at least half of their pay in the different stocks, and a little more if they wish to retain the management. The board of directors must be composed in part of Londoners, and an office must be maintained in London. This investment of English capital in this country has been a great help to us, for it stimulates new enterprises and gives steady work to American labor. Establishments thus capitalized are apt to be permanent, because their affairs have been so carefully examined that their financial stability is sound.

IMITATIVE GENIUS.

The latest literary exploit of Jules Verne is a story of travel and adventure entitled "Cæsar Cascabel." It relates the experiences of a traveling show, consisting of M. Cascabel, acrobat, and his family, together with their horses, dogs, parrot, and monkey, which starts from San Francisco on its way to New York, whence M. Cascabel, having made a snug fortune, proposes to take his party to their home in France. Before they get far on their journey, they are robbed of all their earnings, so the proprietor, who is the most optimistic of men, proposes to return to France by land, crossing on the ice to the Russian possessions, and from thence on until they reach France. They give their entertainment on the journey, during which they meet with such adventures as Jules Verne knows how to invent and describe. The salient feature of the story, however, is, of course, the crossing of Behring's Straits on the ice, and unlucky for M. Verne's claims to originality, that conceit has been already made use of. For example, we read recently in a weekly contemporary the following anecdote relative to the well-known and universally esteemed traveller and author, Col. Thomas W. Knox. "Years ago, Col. Knox and myself were dining with the late H. L. Bateman, at the Grand Hotel, Paris. The conversation turned upon the comparative merits of the steamship lines from America. Bateman asked my ex-

periences, and I replied: 'I do not know anything about the steamers; I came over on a yacht.' Then Bateman appealed to Col. Knox, who said: 'I do not know anything about the steamers, either; I came over by land.' Bateman looked astonished; but the statement was quite true. Col. Knox had journeyed from the Pacific coast, across Behring Straits, through Siberia to Petersburg, and thence to Paris." Probably Col. Knox never did or claimed to have done anything of the sort. But even if he had he was anticipated by the inventive genius of a French novelist named Boussenard, who in 1870 published a lively story entitled "De Paris au Bresil par Terre"—"From Paris to Brazil by land." In this story the hero, a government clerk in Paris, inherits a majestic property in Brazil on the single condition that he shall make it his residence. Being constitutionally afraid of the sea he determines to forego his inheritance rather than encounter the voyage, when a friend offers to escort him the entire distance without taking passage in a boat. The incidents of the journey, involving as it does experiences with Siberian snow and ice, and political exiles, Cossacks, wolves, government officials, and other ferocious attributes of that hyperborean region are related with a graphic preciseness that Verne himself has never excelled in his most imaginative flights. His adoption at this late day of a similar motive for a story will necessitate the introduction of some marvellous collateral incidents in the plot to avert from M. Verne a suspicion of imitation unworthy of his reputation and wholly at variance with his fame for inventive skill.

ELECTRIC MUSIC.

The Electric Club, of this city, inaugurated the winter season of reunions by a banquet at the club house in East Twenty-second Street, on October 2d, which was largely attended, and, as may be imagined, was replete with brilliant accompaniments. One of the most striking the latter was the mysterious introduction during the feast of the music of a band performing in a distant part of the city. When the melodious strains floated upon the ears of the assemblage, there was a general expression of wonder as to their origin. The *Electrical Review* describes the incident as follows: "Just as the champagne began to flow, the attention of the assemblage was arrested by the stirring notes of the "Marseillaise," which came from—no one knew where. In silent interest questioning faces turned here and there trying to discover the source of the music. It was finally noticed that a long-distance telephone receiver had been cleverly concealed in each of the two electroliers, and, beginning at the Long-Distance Telephone headquarters, 18 Cortlandt Street, the strains of the orchestra were gathered up and passed along the copper wires to the banquet hall, where they burst upon the ear as distinctly as though the instruments were but a few feet away. The music was met with great applause, and an encore unanimously demanded. This was given to the delight of the listeners, the number being a cornet solo." The future possibilities of the mysterious force that we know as the electric fluid are as yet beyond the scope of human conjecture, but the present practical applications of electricity are sufficiently wonderful, apart from all other achievements of scientific research, to mark this as pre-eminently the era of human progress.

DANGEROUS FLOUR SACKS.

The poisoning of a number of persons in a Maryland town by eating bread recently was upon investigation found to be due to the fact that red oxide of mercury had been used as a paint for stencilling the brand upon the sacks which had contained the flour from which the bread was made. Flour is very absorbent, and in this case it had absorbed the poison through the interstices of the sacks.

SCIENCE AND CIVILIZATION.

THE DEBT THE WORLD OWES TO SCIENTIFIC INVESTIGATIONS.

There are many thousands of short-sighted people that raise a utilitarian cry against the investigators in pure science. Yet these people use the telephone, the telegraph, the electric light, ride on electric cars, and sigh for further applications of electricity to the needs and uses of everyday life. But they never think of Galvani and his frogs' legs. Take out of the world all that science—studied for the pure love of it—has done, and the habitable globe would be in just the state of uncivilization that Central Africa is to-day. Science does not create labor, nor the industries flowing from it. On the one hand, science is the progeny of the industrial arts; on the other, of the experiences and perceptions that gradually attach themselves to these arts. Industrial labor is one of the parents, and science is the child; but, as we often see in the commercial world the son becomes richer than the father, and raises his position. Man is the ward of science, and from his necessities spring the industrial arts; the mole can mine and tunnel under the ground; the tailor bird can sew; the fishing frog can throw out a line and bait that nature gives him; the beaver can plaster his house; the spider can spin and weave; but neither in his hands nor feet has man the tools for such work as he must perform in order to live. How have the arts received their great impulses from science? In the early ages the raw material at hand led to its industrial application; and later on the country possessing the raw material became impressed with the character of its industries. The mound builders of America became coppersmiths, because they found native copper, which they considered a variety of stone, and chipped and hammered it into tools without knowing how to forge it hot. Savages living out of the region of native minerals became workers in stone, flint, horn, bone or shell. As civilization advanced and commerce became established, the mere possession of raw materials was not the only condition of industry. Possessed of what they considered good weapons, barbarous nations broke through the barriers that shut them from the outside world. While the Thracians were scalping their enemies, and spending much time in tattooing their bodies, their neighbors, the Phenicians, sailing the Mediterranean as the Tyrians had done before them, found their way out into the Atlantic, and thence to the British Isles. The natives of these isles, dressed in skins, and with their bodies daubed over with yellow ocher or woad, were living and fighting over mines of tin and other minerals that they knew not of. The Phenicians found these mines, took back tin and other minerals with them, and established metallurgic industries. They were acting under the guidance of an infant science. As intelligence rose in the British Isles, and an initiatory science was developed from industrial pursuits, the people no longer sold their raw mineral material to distant nations, but manufactured it for themselves. So long as the growing intelligence of a nation equals or exceeds that of any neighboring nation, its prosperity is secure. The moment any nation allows the intellectual element of production to fall below that of its neighbors, a mere local advantage no longer insures superiority. Science and commerce having opened up paths of rapid intercommunication around the globe, the cost of carrying raw material is lessened; and, given an intellectually inferior nation with raw material, the intellectual superiority of another nation far outbalances the possession of that raw material. Intellect is the great factor in commercial success, whether of individuals or nations. Take the case of the skilled bricklayer and of the hod carrier; the first is using brains in his work, the second is using brute force. When he goes up the ladder with his hod of bricks, he has to carry also his own weight—thus wastefully expending force. Some one notices this and substitutes for the brute force of the human that of the horse; then the horse is displaced by the mechanical force of a steam engine, which can do the work of fifteen men or of two horses in the same time. Coal converted into heat is doing all the work. The coal mined each year in the United States represents in actual work more than the sum of the force of the total population of the globe, assuming all to be strong men. Thus the substitution of a natural force for human power vastly increases the productive capacity of the human race. Guided by an intellect taught by science, the natural forces can do in a few hours what the unaided labor of many men could not do in a lifetime. It was not prophecy, but a flash of genius, that drew from Stephenson the assertion that it is the sun that drives the locomotive engine, by being liberated from the coal in which it has been stored for ages. But man can neither create forces nor endow anything with properties; all that he can do is to convert and combine them into utilities. The man that does this with knowledge is spared the dismal failures of ignorance, but he that tries to use powers without understanding them is inevitably punished for his rash presumption. It is this presumption that causes the mortality and disease that follow in the wake of civilization. Natural law, like the civil, never admits ignorance as an excuse. In this century three scientists have revolutionized commerce—Oersted, of Copenhagen, and Faraday and Wheatstone, of London. It was of Faraday that Huxley said, in effect, that any nation would do well to spend $500,000 in discovering such a man, and an equal amount in educating and setting him to work. Bessemer, studying away at steel, has revolutionized ship building. Dr. Joule's studies in the mechanical equivalent of heat produced the compound engine by which the necessary amount of coal for carrying a given cargo has been reduced more than forty times; that is, a steamship that in 1850 carried a cargo at an expenditure of 14,500 lbs. of coal to a ton now does the same work by burning about 350 lbs. Joule's studies in heat have made it possible for a cube of coal that will pass through a ring the size of a 25 cent piece to drive one ton of cargo for two miles in one of the most improved steamships. Every time we strike a match we are indebted to the men that have studied science for the mere love of it. The men that worked away at coal tar "just to see what was in it," made the whole world their debtors by discovering alizarin, the coloring principle of madder. And to these men the world is indebted also for aniline, antipyrine, and more than a hundred other coal tar products. Scientists, wondering what was in crude petroleum, found paraffin and vaseline. Pasteur wondered what caused fermentation; he found out, and brought a new era to wine making. The singing and dancing of a tea

kettle attracted the attention of a brain, and we have as a consequence all the applications of steam. The swinging of a chandelier in an Italian cathedral before the eyes of young Galileo was the beginning of a train of thought that resulted in the invention of the pendulum, and through it to the perfecting of the measurement of time; and thus its application and use in navigation, astronomic observations, and in a thousand ways we now pass by unnoted, has been of such practical and unceasing value that the debt to scientific thought, even in this one instance, can never be known. Science, in its study of abstract truth, is ever giving to man new beginnings. While the devil is engaged in finding mischief for idle hands to do, science is eternally at work finding something useful for them to do. Perhaps not eternally, but so long as there is an earth, so long as there is a human race, and so long as there remains unrevealed one secret of nature, there will be the scientist studying for the pure love of investigation, and discovering abstract truths that shall benefit humanity. If the world shall ever be at peace in a brotherhood of mankind, that peace will owe its existence to the student of nature—the scientist. Science is knowledge; art is skill in using it. A principle of science is a rule in art. Art may make mistakes by wrongly applying or by ignoring the truths of science. Railways, ocean steamships, all the uses of steam and electricity, gas, our huge buildings, our manufactories, and all that adds to our material comfort, are due to the practical application of scientific principles.—*Chicago Herald.*

EARLY RISING.

THE RELATION OF EARLY RISING TO LONGEVITY.

Professor Humphry's recent Collective Investigation Report on Aged Persons contains some very positive evidence on a matter which has already engaged the attention of moralists as well as physicians. "The opportunity for nutrition to do its restorative work was in nearly all provided by the faculty of 'good sleeping,' to which was commonly added its appropriate attendant, the habit of 'early rising.'" Thus there is a relation between early rising and longevity. No doubt many people will hastily seize upon the sentence just quoted, and employ it in edifying lectures or essays for the perusal of youth, or embody it in popular medical works. Important qualifications follow in Dr. Humphry's report, but they are likely to be overlooked. Doubtless the habit of early rising is, in itself, healthy; most of all, it is a good sign of health when it evidently signifies rapid recovery from fatigue. Again, it usually denotes a strong will, the gift, as a rule, of a good physical constitution, or at least the safeguard of average bodily strength. Late risers are generally either invalids or persons of bad habits, idlers who are never free from other vices besides idleness. The nervous exhaustion which keeps a man wakeful throughout the small hours produce sleep late in the morning. This exhaustion is invariably due to one of several life-shortening influences, especially anxiety, of indiscretion in diet or drink. Early rising is thus rather one effect of certain favorable influences, another result of which is longevity, than a cause of longevity. To turn a weakly man out of bed every morning at seven o'clock will not prolong his life. It will be noted that by "good sleeping," Professor Humphry signifies quick sleeping, "that is, the reparative work which has to be done in sleep is done briskly and well." Here again we have an effect of a cause; but preventing a weakly subject from sleeping more than four or five hours nightly would not cause him to live long, but would rather tend to shorten his life. Equally important are Professor Humphry's observations which show that by "early" he does not entirely mean the time by the clock. The word has a "relative significance, with reference to the time of going to bed. A person who retires to rest four hours after midnight and gets up at 10 A. M. may be strictly regarded as an 'early riser.'" Thus, early rising is synonymous in long-life histories with short sleeping, which means rapid recovery from fatigue, a sign of bodily strength. These scientific facts in no wise contradict the alleged value of early rising as a practice to be cultivated by all persons in good health. It is excellent as moral discipline, and eminently healthy as a matter of fact. Most persons will eat three meals daily. When a man gets up late those meals will probably follow each other at too short intervals to be wholesome. When he is an early riser it will probably be otherwise. He can enjoy a good breakfast, and by the time for his lunch or mid-day dinner he will have an honest appetite again.—*British Medical Journal.*

BANANAS.

MEDICINAL AND OTHER USES TO WHICH THEY ARE APPLIED.

"Eos," an old East Indian official, whose communications to the *English Mechanic* are always instructive and interesting, writes as follows anent the banana. We remark, in passing, that Eos regards the banana and plantain as synonyms, whereas in the Gulf States of America and in the West Indies the name "banana" is given to a plant bearing a small but highly flavored fruit always eaten raw, and "plantain" to one bearing a much larger fruit, which is rarely or never eaten uncooked. The tropical order of Musaceæ contains a great number of fruit-producing bananas and plantains in cultivation, the varieties of the former being about ten times the number of the latter, nearly all of which have originated by culture and selection from the sole wild, aboriginal species of India. This bears a coarse, tough, insipid fruit, full of hard seeds the size of a pea. Even the wild monkey does not care to take it, though all the pachydermatous quadrupeds delight to browse on its succulent shoots. These trees all bear hermaphrodite or bisexual flowers, yet remarkably fertile. "A long course of experiments in the botanical gardens resulted in the opinion that all varieties have originated from the inedible indigenous species—seeds of the same from uninhabited tracts having in the course of years yielded delicious bananas and plantains, by which latter designation they are generally known to all Europeans in the East, with whom they are a favorite addition to a midday meal of bread and cheese. They are also sliced and sun-dried after being sprinkled with sugar—a dainty not unlike Smyrna figs. With boiled rice the ripe fruit furnishes a common repast to the villagers, whose plot always contains a plantation, yielding shade and food, the immature spathes and unripe fruit being also used in fish curries. I have often eaten them cooked in that way. It is a preventive of sunstroke. The smooth, cool leaves are frequently employed as a hat-lining by Englishmen, and in all the hospitals a daily supply is at hand; the leaf being smeared with fresh butter or spermaceti ointment is a most pleasant and healing dressing to open sores. Besides these officinal uses, the natural waterproof foliage always supplied me with a ready roof in my wanderings. Within a hastily constructed hut of sticks covered with the above I was once weather-bound for forty-eight hours in a region where the annual rainfall is estimated by feet and not by inches. My canvas also had light, movable canopies of the same material as a lining to the split-cane matting, which would otherwise have leaked. The umbrella hats, too, of the primitive agriculturists are put together in the same fashion, giving their nude figures, when planting rice in a swamp, a most outlandish appearance. I have seen few specimens of bananas or plantains above twelve feet in height; but the spread of graceful, floating foliage, waving to and fro in the mildest breeze of an extremely humid atmosphere, renders *Musa* a very difficult subject for class treatment. Moreover, the huge, spongy, water-filled trunks (divisible with a penknife) decay annually, a succession of rapidly-increasing stools supplying the vacancy. Two very pretty dwarf kinds from China, *M. cavendishii* and *M. coccinea*, are occasionally to be seen as ornamental plants in the larger conservatories of England. Their fruit in India is considered worthless. Extensive groves of the one aboriginal species are met with in all forest lands of the Northeastern frontier, extending along the banks of the Upper Brahmapootra. In a soil composed of alluvium and decayed timber they there increase and multiply on a large scale, the crowd of vivid green drooping foliage adding great beauty to the river scenery. A long period of artificial culture causes increase of pulp and diminution of the seeds, which, under the same conditions as other tropical fruits, finally disappear or become barren specks. I found the artichoke heads follow the same law, my splendid specimens requiring after-propagation by suckers only. I accidentally met with a wonderful banana, a Shan chief having sent a basketful to a friend. The fruits were enormous, with rosy red rinds, and the room was perfumed with their spicy odor. Their flavor was that of a mild addition to the pulp of cloves and cinnamon. I gave some small presents to the Shan, and in return I received a package of several roots, which I duly planted in a garden, with the view of eventually sending them by steamer to Calcutta, but they were all stolen soon after being placed in the soil. Some Asamese marauder knew the value of the spoil. Illicit stills have long ago utilized the plantain fruit, from the large amount of saccharin contained in the pulp and its cheapness (for an enormous bunch often fetches no more than 6d. to 1s. in a remote spot); very strong liquors can be made at little outlay. It is a fattening diet for man and all frugivorous creatures. Frosty nights and dry, burning winds in North India, unfortunately, damage its culture, except in well-protected inclosures of mud walls or groves of evergreen trees. I was once proceeding on a branch of the Upper Brahmapootra "to smoke the pipe of peace" with some jovial savages of good character. As my canoe rounded a heavy forest I came on my expected guests, who all jumped overboard, and, with merry shouts, disappeared together in the wilderness, old and young alike. In a short time a procession came into my presence, "elegantly attired" in primeval skirts of plantain leaf, put together with thorns. "The British Government has forbidden nudity in its territory," said the leader, "and we have complied with the order."

MIXED DIET.—A German professor says all who eat water-cress consume at the same time a full assortment of minute insects.

WHAT IS IT?—English anti-vivisectionists are interested in an advertisement of "live fish, dressed ready for cooking," that has appeared in one of the religious weeklies.

SPICED COCOANUT.—A new industry is springing up in Brazil, consequent upon the discovery of an ingenious Portuguese. He has struck the novel idea of canning cocoanuts in spiced syrups, and these are said to be particularly well received in Portugal, to which country consignments have already been made.

COFFEE SCHEMES.—It is reported that coffee plantations are being bought, bonded or controlled to the extent that, in a year or two, an entire change in the manner of placing coffee upon the market will be in operation. The new method will be that a few men will keep coffee up to the highest possible prices the people will pay.

INTERESTS IMPROVED BY ELECTRICITY.—Electricity is doing more for the country towns, says the Pittsburg *Dispatch*, than all other agencies combined. It is lighting villages that would otherwise be groping in the dark, for gas corporations do not settle in such places; the game is not big enough. But the greatest thing electricity is doing for the small towns is the running of the street cars. This has given them a forward impetus that has been of immense benefit to all of their business interests. A great deal of the vim and push seen in Western Pennsylvania towns is due to electricity.

CUBAN COCOA.

ITS EXTENSIVE CULTIVATION IN CONNECTION WITH COFFEE.

The French consul at Santiago, in a report to his government, says that the cultivation of cocoa is closely connected in Cuba with that of coffee, and is carried on at the same time and on the same properties. In fact, every coffee planter, if the nature of the soil permits him to do so, sows between the rows of young plants cocoa berries, which will produce trees that will continue to bear crops when the coffee plants have ceased to produce. It is impossible to discover the precise date at which the cultivation of cocoa was introduced into the island, but as this plant was cultivated in Mexico and New Grenada before the Conquest, it cannot long have remained unknown to the Spanish colonists in Cuba, who kept up constant communication with the possessions of Spain on the American continent. It was not, however, until about 1830 that several planters made an effort to introduce cocoa into Cuba, and at this time plantations of a certain importance were formed at Figueroa and elsewhere. Unfortunately, for many years the cultivation of the cocoa remained unprofitable in consequence ef the small demand and the low selling price. The price slowly rose, however, the number of cocoa plantations increased, and, by 1860, every coffee plantation in Cuba combined the cultivation of the cocoa, if the nature of the soil permitted it. The cocoa tree lives longer than the coffee plant, but it is much slower in producing. It takes, in fact, five or six years before the newly-planted cocoa begins to bear fruit; it is at its full bearing at the end of the year, and begins to decline at the end of fifteen, but without ceasing to bear; on some old estates there exist cocoa trees of upwards of fifty years of age, which still produce. The cocoa is usually planted in the spring, by preference directly after rain; an interval of from ten to twelve feet is usually left between the plants. The kinds which are most used are those of Caracas, Guayaquil and the Creole variety, which latter is said to come from Trinidad. The Caracas and Guayaquil varieties bear the finest fruit, but they are not so hardy, and do not bear so well in Cuba as the Creole variety. The Caracas, however, fetches the best price. The crop is gathered from the month of October to the month of August. During this period the trees are covered with blossoms, and little bunches of ripe and half-ripe pods. The crop may, therefore, be gathered day by day, but, as it is difficult to obtain the laborers necessary for the work, the owners generally prefer to harvest monthly or fortnightly. To prevent fraud as much as possible, the laborers are paid by piece work, and receive wages calculated upon the number of measures of fruit which they pick. There is no harm done by leaving the pods on the bushes for one, two or even four weeks, except in the spring, when, if possible, they should be picked at shorter intervals. The cultivation of cocoa, like that of coffee, is undertaken with the aid of colonists, who are hired by the day. The day is calculated from 6 A. M. to 4 P. M., for which time a man is paid about 2s. 6d. if food is not included, and about 6d. less if it is. The colonists are farmers to whom the proprietor of a cocoa plantation has let a piece of ground, with the right to cultivate fruit or vegetables, but with the obligation of yielding the planter half or two-thirds of the cocoa gathered on the same piece of ground. Cocoa is weeded in the same way as coffee; but as the cocoa tree sometimes grows to a height of fifteen or twenty feet, it is not so much troubled by coarse weeds as the coffee is. The spread of weeds is, moreover, checked in cocoa plantations by the continual fall of leaves, which soon cover the ground. The cocoa is pruned in the same way as the coffee tree, with a view to prevent each plant growing too high and mingling its branches with those of its neighbors. It is necessary always to take great care to remove the suckers which are continually being thrown up from the foot of the tree. As soon as the pods are ripe they are pricked and broken on the spot. The berries, which are full of a curious syrup, are measured and piled up in heaps, covered with leaves. The heaps are allowed to ferment for two or three days, the fermentation being regulated every morning by a rearrangement of the heaps. This process softens the bitterness of the berry, destroys the gum which surrounds it, and enables the cocoa to dry more rapidly.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

October.

MEATS.—Beef, mutton, ham, kidneys, liver, venison, sausage.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock, brant, grouse, partridge, rabbit, snipe, goose.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, pike, porgie, prawn, rockfish, salmon, sea bass, sturgeon, smelt, turtle, white fish, whiting.

VEGETABLES.—Artichokes, beets, beans, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips, water cress.

FRUITS.—Apples, bananas, blackberries, grapes, melons, oranges, peaches, pears, pineapples.

PRACTICAL RECIPES.

BEEF AND CHEESE.—Mince fine two cupfuls of cold beef, season it with salt and pepper and a chopped onion; boil some macaroni until tender in soup stock; put the meat in a deep pie plate, and over it a layer of the macaroni; pour some gravy or broth over it, then grate cheese on plentifully and brown in the oven.

HASHED POTATOES.—Chop into dice two or three fine raw potatoes; season them well with salt, pepper and chopped parsley. Let your frying pan get very hot, put in a good lump of butter, and when it is melted put in the chopped potatoes; sprinkle bits of butter over the top, cover with a pan, and let them cook without stirring until the top ones are tender; heat a small platter and turn the potatoes on to it as you would an omelet; very nice.

BAKED PEARS.—Select fine cooking pears; lay them in a baking dish, and pour over them some New Orleans molasses; as they cook baste frequently; eat cold.

MRS. C's CHEESE FONDER.—Beat three eggs, yolks and whites separately; grate one cupful rich cheese; take one pint of cream and into it beat the egg yolks; add the cheese and a little cayenne pepper, and the last thing whip in lightly the egg whites; have ready a buttered baking dish, pour the mixture in, and bake in a steady oven for ten minutes or so until it sets; serve immediately.

LOBSTER PATTIES.—Take the meat from a lobster and cut it into small pieces; season it with salt, pepper and one-half cup of stewed tomatoes; stir over the fire until very hot, then put it into patty pans lined with pie crust and bake for a few moments. When done garnish with parsley and sliced lemon and serve.

QUINCE CUSTARD.—Pare, slice and stew gently until tender three or four quinces, with only just enough water to cover them; strain the juice from them through a jelly bag; take two cups of it and add three-quarters of a cup of sugar and boil; beat well the yolks of nine or ten eggs, and add them gradually to the hot juice; pour the custard into a farina kettle and stir till it thickens, then pour into custard cups, and serve when quite cold.

MRS. W.'S SOFT GINGER BREAD.—Six cupfuls flour, three cupfuls molasses, two cupfuls sugar, two cupfuls butter, one cupful milk, four eggs, one tablespoonful soda, spices to taste, ginger, of course, predominating; bake slowly.

THE GENTLEMAN.

A GENTLE AND MANLY DESCRIPTION OF HIM BY CARDINAL NEWMAN.

It is almost a definition of a gentleman to say that he is one who never inflicts pain. This description is both refined, and, so far as it goes, accurate. He is mainly occupied in merely removing the obstacles which hinder the free and unembarrassed action of those about him, and he concurs with their movements rather than takes the initiative himself. His benefits may be considered as parallel to what are called comforts or conveniences in arrangements of a personal nature—like an easy chair or a good fire, which do their part in dispelling cold and fatigue, though nature provides both means of rest and animal heat without them. The true gentleman in like manner carefully avoids whatever may cause a jar or a jolt in the minds of those with whom he is cast—all clashing of opinion, or collision of feeling, all restraint, or suspicion, or gloom, or resentment; his great concern being to make every one at their ease and at home. He has his eyes on all his company; he is tender toward the bashful, gentle toward the distant, and merciful toward the absurd. He can recollect to whom he is speaking; he guards against unseasonable allusions, or topics which may irritate; he is seldom prominent in conversation, and never wearisome. He makes light of favors when he does them, and seems to be receiving when he is conferring. He never speaks of himself except when compelled, never defends himself by a mere retort; he has no ears for slander or gossip, is scrupulous in imputing motives to those who interfere with him, and interprets everything for the best. He is never mean or little in his disputes, never takes unfair advantage, never mistakes personalities or sharp sayings for arguments, or insinuates evil which he dare not say out. From a long-sighted prudence, he observes the maxim of the ancient sage, that we should ever conduct ourselves toward our enemy as if he were one day to be our friend. He has too much good sense to be affronted at insults; he is too well employed to remember injuries, and too indolent to bear malice. He is patient, forbearing, and resigned on philosophic principles; he submits to pain because it is inevitable, to bereavement because it is irreparable, and to death because it is his destiny. If he engages in controversy of any kind, his disciplined intellect preserves him from the blundering discourtesy of better, perhaps, but less educated minds, who, like blunt weapons, tear and hack instead of cutting clean, who mistake the point in argument, waste their strength on trifles, misconceive their adversary, and leave the question more involved than they find it. He may be right or wrong in his opinion, but he is too clear-headed to be unjust. He is as simple as he is forcible, and as brief as he is decisive. Nowhere shall we find greater candor, consideration, indulgence; he throws himself into the minds of his opponents; he accounts for their mistakes. He knows the weakness of human reason as well as its strength, its province, and its limits. If he be an unbeliever, he will be too profound and large-minded to ridicule religion or to act against it; he is too wise to be a dogmatist or fanatic in his infidelity. He respects piety and devotion; he even supports institutions as venerable, beautiful or useful, to which he does not assent; he honors the ministers of religion, and it contents him to decline its mysteries, without assailing or denouncing them. He is a friend of religious toleration, and that

not only because his philosophy has taught him to look on all forms of faith with an impartial eye, but also from the gentleness and effeminacy of feeling which is the attendant on civilization. Not that he may not hold a religion, too, in his own way, even when he is not a Christian. In that case his religion is one of imagination and sentiment; it is the embodiment of those ideas of the sublime, majestic and beautiful without which there can be no large philosophy. Sometimes he acknowledges the being of God; sometimes he invests an unknown principle or qualities with the attribute of perfection. And this deduction of his reason or creation of his fancy he makes the occasion of such excellent thoughts, and the starting-point of so varied and systematic a teaching that he even seems like a disciple of Christianity itself. From the very accuracy and steadiness of his logical powers, he is able to see what sentiments are consistent in those who hold any religious doctrine at all, and he appears to others to feel and to hold a whole circle of theological truths, which exist in his mind not otherwise than as a number of deductions.

MISLEADING NAMES.

SOME ABSURD ERRORS TO WHICH THEY GIVE RISE.

London *Electrician* calls attention to some curious coincidences between the names of inventors and mechanical appliances which have given rise to absurd mistakes. It was commonly supposed years ago that the Brush machine was so called on account of some special kind of brushes, and that the Lever arc lamp derived its name from two peculiar levers in its mechanism. "The Ball dynamo has no spherical armature, as might be supposed. The Short electric railway system is not specially adapted for lines of limited length. Bright shackles are never polished, and the Siemens galvanometer has nothing to do with the mariners' compass, with which beginners sometimes confound it. The Parsons engine is not a clerical device, and the Upward battery has nothing in common with Excelsior carbons. Such popular errors may be excused, however, when we find a recognized text-book explaining the Daniells cell as being so called because of its constancy!"

Patent Rights.—To infringe a patent it is not necessary that the thing patented should be adopted in every particular. If the patent is adopted substantially by the defendants, they are guilty of infringement.—*Scientific American.*

Philanthropic Canners.—A canning factory will shortly be started in Chicago with the object of assisting poor and industrious women. All kinds of fruits will be preserved at the factory, and the profits will be used exclusively for the benefit of the employes, the ladies having charge of the enterprise asking no compensation for their services. The enterprise is a worthy one, and deserves to succeed. The ladies having the matter in hand belong to the best social circles.

How to Sweep a Store.—"We don't use a leaky old sprinkling pot to sop the flour all over in puddles when we sweep. No, sir! We have wet sawdust, and I put a row of it across one end of the store and sweep that right along to the other end, just like a regiment marching across a ten-acre lot. It catches all the dirt and carries it along. If it gets a little dry, I add some more. Some folks scatter sawdust all over the floor, but that's no good; the reason for using sawdust is to avoid wetting the floor all over, and to have something that will absorb the dust."—*Com. Enquirer.*

Salaried Physicians.—In Tiflis, Russia, a club of 125 families just formed has hired a doctor, M. Oganiants, for $60 per year, who agrees to visit the families regularly and give them advice as to how to keep healthy, to tend them if sick, and, besides, to give the club occasional short lectures upon hygiene and physiology. Each family pays fifty cents per month for this service, and twenty-five poor families are admitted free. Similar arrangements have been made with the druggist.

TYPE SETTING MACHINES.

A PREDICTED REVOLUTION IN THE PRINTING BUSINESS.

The sucessful introduction of typesetting machines into a number of newspaper offices in the United States has greatly stimulated their competitors, and early in the autumn the New York *Sun*, *Times*, *World*, and other papers will commence their use. It is also said that the *Herald* will employ them. Probably one-half of the one thousand compositors engaged upon the morning dailies will be dropped. It is now announced that Theodore L. De Vinne, the printer of the *Century* magazine, has completed arrangements to have his typesetting done by machinery. Upon reliable authority it is stated that a syndicate of book publishers in New York have likewise made arrangements to put fifty or a hundred typesetting machines into a co-operate office, where all the body matter of cheap publications turned out in New York will be set up. This arrangement, which will be in working order upon the first of next January, is likely to increase the annual output of novels by one hundred per cent. and reduce the already low price one-half. The announcement that the *Century* magazine is to be set up by machinery, following so closely upon the action of several publishers of New York daily newspapers, who have made arrangements to introduce the Rogers and Morgenthaler machines into their composing rooms this fall, will be of momentous interest to the printers. A member of New York Typographical Union No. 6 says: "Of course some members of the Union are a little skeptical as to the benefit these machines will be to the followers of the craft, but the whole history of labor-saving machinery teaches us that nothing has yet been invented that has lessened the need of good workmen. When typesetting machines have been introduced into every newspaper office in the country, it will lessen the cost of composition to such an extent that papers which now contain eight pages will have twelve, and four-page papers will be increased to eight. The introduction of the machines will be a good thing for first-class men, but it may injure those who make a practice of tramping all over the country, working only one or two nights at a time."—*National Publisher*.

RAPID CLEANSERS.

SOME CHEMICAL MIXTURES FOR CLEANSING THE HANDS.

In chemical works, it is not an uncommon occurrence for one's hands to become so soiled with the various well-defined and separate nastinesses to be found there as to be found quite insusceptible of cleansing by ordinary soaps or soap powders. One or two chemists of our acquaintance, the *Chemical Trade Journal* says, use a mixture under these circumstances, which we publish for the benefit of those of our readers who care to try it. Take about two or three grammes of bleaching powder, the same quantity of soda ash, and about twice their bulk of sawdust. Completely saturate these with caustic soda liquor, say 10 or 15 Twaddell, and quickly rub over the hands. As soon as the desired effect is produced, rinse the hands with water. It is occasionally necessary to repeat the process, but, as a rule, one application suffices to make the hands perfectly clean. There is an odor of bleaching powder perceptible from hands thus treated, to which some may object, but this may be destroyed, and the appearance of the hands still further improved by rubbing them over with a little sulphurous acid solution or by rubbing first with a solution of sulphite or hyposulphite of soda, or sulphite of ammonia, and while still wet from this, rubbing over with very dilute hydrochloric or sulphuric acid. The hands should be well washed with water, and a little 10 per cent. glycerine rubbed in to keep them soft. Nitric acid stains on the hands still appear to defy all comers, except pumice stone, but inks and organic stains may—in the absence of bleaching powder—be generally removed by a mixture of chlorate of potash and hydrochloric acid.

BUSINESS NOTES.

FINE PRESERVES.

No better preserves, jams and jellies, than those put up by Gordon & Dilworth, New York, can be bought anywhere. They are absolutely the best fruits in market, cleanly prepared, and preserved with sugar only. No chemicals of any kind are ever employed.

A SPLENDID LAMP.

Sometimes a patent is worth something. Five years ago a poor inventor of Rochester, N. Y., was hawking about among lamp makers a new patent burner, without success. He was pooh-poohed and discouraged. Finally a Mr. C. S. Upton, who had a good nose for a trade, took it in hand, and now the royalties paid on the lamps made under the patent aggregate a fortune yearly. Over two million of "Rochester" lamps have been sold, and the proprietor has in New York the largest lamp store in the world, with branches in Paris and Chicago.

ADJUSTABLE DRILL.—A machine has been invented for drilling square, oblong or hexagonal holes, heretofore found impossible.

COLD WATER IN THE SEA.—Late investigations have proved that the majority of deep-sea depressions come from other than volcanic origin, and that the coldest waters of the ocean stand in the deep troughs instead of running, as was formerly thought to be the case.

ADULTERATION OF LARD.—A strange way of adulterating lard was observed at the laboratory of Dr. Van Hamel Roos, says the *Zeitsch. f. Nahrungsm.* A sample of lard, from Belgium was found to contain 45.58 per cent. of water. As it is impossible to mix fat and water in this proportion by any ordinary method, the author had resorted to saponification, and by the addition of small amounts of alkalies was enabled to add water in this large proportion.—*Weekly Med. Review.*

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CONTENTS.

TRADE EDUCATION.

A speaker at a recent meeting of the Typothetæ, or society of master printers, in Boston, declared that the serious problems now presenting themselves in somewhat formidable aspect in this country, in regard to the education of skilled labor, will find their true solution in the mechanical trade schools which are springing into existence in our large cities. The difficulty in question is of threatening proportions, and in behalf of the future welfare of our industrial interests it is imperative that prompt measures be adopted for its settlement. Happily, the trade schools offer apparently the precise means to that end. The apprentice system, which formerly afforded to American boys the means of trade education, has been abandoned, and is now hardly anywhere in practical use. It is futile to discuss the merits and demerits of that system in view of the facts. Whether good, bad or indifferent, our people have departed from it, and there is every reason to believe they will never return to it. We may regret it—and some of our conservative mechanics doubtless do regret it—but that does not alter the case in the least. The fact is that apprenticeship is a thing of the past, a bygone institution so far as America is concerned. We could not revive it if we wanted to, and it is, therefore, incumbent upon us to provide other means whereby our youth can acquire mastery of the handicrafts by which the work of the community is carried on. The means best adapted to this use in this country is the trade school.

CONTAGION, INFECTION AND SANITATION.

Most persons, we presume, regard as synonymous the terms contagion and infection. The dictionaries, however, show these words to have different meanings, and the distinction between them is clearly explained in a pamphlet before us entitled "Defences against Epidemic Diseases," written by Dr. Cyrus Edson, the well-known Chief Inspector of the Board of Health of this city. According to that competent authority, the term contagion is applied to those disease poisons that require direct contact with the person suffering from them to effect their reproduction, while infection is transmissible through the medium of the air or of some other agent, as water or food. The poison of glanders and malignant pustule is contagious, while that of cholera, yellow fever, typhus and typhoid fevers, tuberculosis, smallpox, and scarlet and other eruptive fevers of childhood is infectious. This classification does not perfectly cover the ground, as some of the latter diseases are both contagious and infectious. The poison of the infectious diseases interests us most, for these diseases are most common and most fatal. The power they have of infecting the air we breathe and the food and water we take into our systems makes them rank among the deadliest enemies of mankind. In the Health Department of this city, Dr. Edson says further on, a special bureau has charge of all matters relating to contagious and infectious diseases. This bureau comprises the corps of medical sanitary inspectors, the vaccinating corps, the disinfecting corps, and the summer medical corps. An ordinance of the Sanitary Corps compels physicians to report to the Health Department all cases of contagious and infectious disease. The moment a case is reported it is referred to the medical sanitary inspector in whose district it occurs. Eleven medical sanitary inspectors have in their charge as many districts, into which the city is divided. The inspector visits each case referred to him, supervising its isolation, and preventing persons who have been exposed to infection or contagion from intermingling with others. Business conducted in apartments in which transmissible disease exists is stopped until the sick have recovered. All unsanitary surroundings that increase the severity of the disease or tend to favor the retention of its poison are removed by an order served upon the owner of the dwelling. In case isolation on the premises cannot be effected, by reason of the construction of the house, or in the event of the sick person being too poor to employ a physician, the patient is moved to a hospital for proper treatment. Should the disease be smallpox, it is also referred to the vaccinator in whose district it occurs; and for this purpose the city is divided into as many districts as are necessary efficiently to cope with the number of cases of smallpox daily occurring. About 30,000 children and from 50,000 to 60,000 adults are vaccinated each year. That branch of the Health Department was organized in 1874, and its efficacy is shown in the fact that while prior to 1876 the deaths from smallpox averaged 59.57 of every hundred thousand of the city's population, since that year they have averaged only 8.38 per hundred thousand, and this average is being steadily reduced, so that during the past sixteen months there have been only two cases of the disease in New York City. It is in this way that the advancement of sanitary science is marked by the lengthening of the terms of human life. During the sixteenth and seventeenth centuries epidemics swept over the civilized world, almost depopulating it. Smallpox alone never entirely ceased, and every few years it became a great epidemic, even as late as the eighteenth century. Almost every person sickened of it once in his life. An immense number were blinded. Of infants, one-third died before their first year, and one-half before their fifth year. Asiatic cholera, the black death, typhus fever, and other epidemics also wrought fearful havoc. Sanitary art, now become sanitary science, stands an able protector against these. Armed with the effective weapons she places in our hands, we no longer dread such fearful visitations. Yet this science is but in its infancy. When it has reached its full growth the filth diseases, now already called the 'preventable diseases,' will be things of the past."

METROPOLITAN MILK.

The *Sun*, with its customary alertness, disposed effectively last week of a silly story that had been going the rounds recently of a consignment of fifty barrels of chalk for a New York dairy, seen at the East St. Louis depot. The fact is that no such compound is permitted to enter the milk sold in New York. The State and local inspection is so rigorous and so much aided by the competition of dealers, that there is little sale for impure milk hereabouts. The punishment for the mere possession of adulterated milk is too great to be risked by any dealer who has a considerable custom, even in the poorer quarters of the city.

THE END OF THE WORLD.

THE SUBJECT CONSIDERED FROM A SCIENTIFIC STANDPOINT.

(*From the French of Jaques Leotard*)

It would seem impossible that, in our epoch of civilization and progress, there could still be found people to announce the approaching end of the world, and, what is much more extraordinary, that there could be found other people to give credence to them. Such is the case, however. A few charlatans, who perhaps descend from the middle age astrologers, whose ridiculous methods of divination they doubtless employ, have recently predicted that the world is shortly to come to an end, the date being fixed by some at 1898, and by others at 1901. These grotesque predictions, born of ignorance, have suggested to us the idea of succinctly presenting to our readers the rational causes that, according to the present state of scientific knowledge, might lead, not to the end of the entire universe, but only to that of our world, that is to say, to the disappearance of life from the terrestrial globe. We hope thus to reassure those, if there be any such, whom the predictions of sorcerers or jesters may have somewhat frightened. At the present day, the public shows itself very incredulous upon this subject, but it was not always thus. In the past ages, when the absurdest superstition reigned, the astrologers found no difficulty in making people believe their idle tales. The year 1000, for example, is especially memorable for the great terror that extended over France and entire Europe, at the announcement of the end of the world. The advent of comets and the eclipses of the sun and moon were the chief pretexts for the frightful astrological predictions. The mortal terror with which France was seized in 1564, upon the news that a total eclipse of the sun was to occur, has remained particularly celebrated. The people, believing that the end of the world was at hand, ran to the churches in crowds to confess. A certain chronicler of the time tells us that a country curate, not being able to fulfill his task, was obliged to say to his parishioners: "My brethren, don't be in such haste; the eclipse is postponed for a fortnight!" In reality, there is nothing very alarming in the prospect of the ending of the world. That happens to every man on the day of his death, and the supreme event would not be any more terrible if it happened to all on the same day. Terrestrial life depends entirely upon the light and heat of the sun, which is the sole source of its maintenance. It is therefore with the star of day that we have to begin the strange tableau of the probable causes of the end of the world. The sun, its spots and its final extinction. The surface of the sun is often strewed with black spots, the smallest of which are as large as the diameter of the earth, and the largest of which are sometimes visible to the naked eye. These spots, which are variable in number and position, mark regions in which the luminous and calorific activity of the sun is in a state of temporary diminution. As the great radiant star is an incandescent mass (1,372,000 times more bulky than the earth) that unremittingly distributes its elements of life around it, it is continually losing (though slowly, it is true) the powerful energy that is stored up in it. A day will come in the distant ages when the spots that are already darkening the sun will cover its entire surface. A solid crust will afterward form, as one has formed upon the earth, which also traversed these phases of the life of a star, for our earth was a sun that had the moon for a planet, and perhaps even (according to Mr. Stanislas Mennier) a second satellite that is now broken up. The sun will therefore be extinguished some day for want of fuel, but that fatal date will be far in the distant future, for we can estimate the time necessary for the extinction of the sun at more than twenty million of years, and the time during which a state of life analagous to the present one will be able to exist upon the earth may be estimated at half that long period. Long before the end of these far distant epochs the progressive decrease of the solar heat will cause the glacial zones of the poles to extend toward the equator. Man, remaining almost alone upon the debris of terrestrial life, after having reached a transcendent civilization, will employ all the resources of his vast genius to fight a supreme battle with death. Perhaps he will then descend, one by one, the steps of his physical and intellectual development, and lead the miserable life of the Laplander and Esquimo under the equator. Then, the last human family, exhausted by cold and hunger, will sleep its eternal sleep upon the frozen and depopulated earth. Although the existence of animate beings is still far from being endangered upon our planet through the extinction of the sun, the terrestrial world is none the less exposed to catastrophes of other kinds. When a brilliant comet appears and grows in magnitude in the depths of the heavens, popular superstition beholds in it an omen of dire misfortune, without knowing the only danger that the haired star threatens us with—that of a collision. We may find examples of this superstition in ancient as well as in modern times. Here is what we may read in Pliny, and which relates to the comet of the year 48: "In the war between Cæsar and Pompey we saw an example of the terrible effects that the advent of comets carries in its train. Toward the beginning of this war the darkest nights were illumined, according to Lucan, by unknown stars, the heavens seemed to be on fire, glowing firebrands traversed the depths of space in all directions, and the comet, that appalling star, which overthrows the powers of the earth, exhibited its terrible coma." These superstitious terrors inspired by comets have exerted their influence in our own age. The famous Encke's comet, that appeared in January, 1819, was the cause of lively apprehension in France, where sinister prophecies had been disseminated. At Paris the provisions of the end of the world were taken more pleasantly, and songs and caricatures were made concerning it. Among the millions of comets that are submitted to the attraction of the sun there are relatively few that approach the radiant star as far as to the orbit of our globe. The majority of the immense comets that occasionally traverse the heavens should therefore leave timid people indifferent. Those which, in their trip around the sun, pierce the plane of the terrestrial orbit, can alone menace us with some danger. We know that these celestial bodies have a very irregular course and a most erratic conduct, for the least attraction of a neighboring star suffices to swerve them from their primitive route and make them approach the disturbing mass. In order that a collision may occur between a comet and the earth, the orbit of the first star must intersect the orbit of the second, and the latter must be at the point of contact of the two orbits at the time of the passage of the comet. It will be understood that such a combination of circumstances, although possible, has few chances of occurring. In fact, when a comet appears that is to approach the sun as near as we do, a calculation of the probabilities demonstrates that out of the 280,000,000 chances there is but one that it will collide with the earth We can consequently remain very tranquil on this subject. Yet, since we are assured that such a collision is among the number of facts possible, let us see what might be the consequences of this celestial meeting of the earth (traveling 18 miles per second) and a comet that had least an equal velocity. If the comet had a consistent nucleus, the terrestrial crust would be staved in by the impact, and the torrents of lava that it conceals would produce a terrible commotion in contact with the waters of the ocean. In addition, the axis of the earth would be abruptly displaced. This is the sole plausible hypothesis to explain the inclinations of the axis of planets upon their orbit; but it is only right to say that no comet with a consistent nucleus has as yet been observed. Were the comet formed of dense gases, it would cause an enormous pressure upon our atmosphere, and bring on a hurricane a hundred times more terrific than the great cyclones, and would level the surface of the earth. It might also render the air unsuited for maintaining life by altering its chemical composition through the introduction of a new gas, or kindle an immense fire, such as the temporary stars sometimes offer us the spectacle of. It is difficult to imagine the frightful consequences of such cataclysms for the animate beings who would be liable to perish among the chaos of unchained elements. Shooting stars—those strange meteors that shine for scarcely a second in tracing a line of fire upon the celestial vault—are now considered by numerous astronomers as having a cometary origin, they being, so to speak, the debris of the haired stars. There exists a convincing example of this that will prove to us the possibility of a collision between the earth and the erratic bodies under consideration. In 1832, Biela's comet, which accomplishes its revolution around the sun in the short period of six years and a half, intersected our orbit on the 29th of October, at the point the earth reached on the 30th of November, say a month later. At the time of its appearance in 1846, the comet had divided into two, and in 1852 the twin comets were observed traveling together. Since this last passage astronomers have not seen Biela's comet, but on the 27th of November, 1872, at the epoch that it crossed the terrestrial orbit, we traversed a mass of cosmic dust, which, on penetrating our atmosphere, gave rise to a true shower of shooting stars. On the 27th of November, 1885, we beheld a new conflagration of the heavens. Here, then, we have a demonstrated collision between the earth and the debris of a comet—a collision that will be repeated under the same conditions in 1898, a fact that has furnished an improvised scientist an occasion to announce the end of the world at that date. Let us hope that fate will protect our globe for numerous ages by preventing it from running against a good, healthy comet, and let us see what are the other dangers that threaten terrestrial life. Before reaching the present period of its history, the earth passed in succession through great geological phases, during which its continents and seas were several times deranged by the internal forces that its nucleus of matter in fusion developed. None of these revolutions has been able to destroy the powerful germs of life, and it is to-day more impossible than ever for a geological cataclysm to cause such a result.. The most important of the historic catastrophes of this kind is contemporaneous. We refer to the gigantic eruption of Krakatoa, in 1883, which claimed 50,000 victims, and totally transformed the configuration of the Strait of Sunda. Despite their great violence, such phenomena are always local, and consequently without untoward influence upon animate beings collectively. The internal activity of our planet is now greatly reduced. So the earth has entered upon the calm period of its existence. A rapid examination of this progressive diminution of internal energy is to lead us to a particularly rational solution of the problem of the world's end. When the solid crust of our globe formed, it surrounded an incandescent fluid spheroid, which afterward condensed toward its centre under the action of cooling. In measure as it contracted this nucleus diminished in volume, and the external covering gave way in places, and cracked, in order to follow the motion of shrinkage. It is in this way that were produced the large folds that formed the principal reliefs of the surface. Consequently, the terrestrial crust, having become thicker, will be covered with enormous crevasses through which the oceans and atmosphere will be gradually absorbed in the numerous internal spaces. The surface of the moon, deprived of air and water, with the immense furrows that traverse its plains and mountains, presents the spectacle of the beginning of rupture, for our satellite is more advanced in development than the terrestrial globe. Having passed this stage, the dead star, cracked in all directions, will break in pieces, and the fragments will be scattered along its orbit. This destiny of the earth is still a thing of a very remote future. Yet it seems as if the natural evolution of our globe will cause the disappearance of life long before the extinction of

the sun. It is, moreover, easy to see that in the geological epochs lost in the night of ages the vital forces were more powerful than those of our day. We have a proof of this in the exuberance of life that then gave birth to animals and plant beside which the present gigantic beings are but dwarfs. The day on which, through such general weakening of vitality, man will have fallen into a physical decadence that his refined intelligence will not be able to supply the place of, will probably be also the day on which the last representatives of our race and of the entire creation will have to live in the bowels of the earth in the pursuit of air and water, which will slowly descend toward the centre of the earth. Deprived of atmospheric fluid, the surface of the globe will thereafter have for temperature only that of interstellary space, say a hundred Centigrade degrees below zero! And while our human race will be reimmersed in the nihility from which it had emerged for a few thousands of centuries, other humanities will succeed one another upon the innumerable stars that people infinite space.

ALCOHOLS.

THEIR VARIETY, CHEMICAL COMPOSITION AND CHANGES.

An alcohol may be broadly defined as a compound of carbon and hydrogen, in which one atom of hydrogen (H) has been replaced by the radical hydroxyl (HO). Thus common alcohol is derived from the hydrocarbon ethane (C_2H_6), which may be represented by a structural formula as follows:

$$\begin{array}{ccccccc} & & H & & H & & \\ & & | & & | & & \\ H & - & C & - & C & - & H \\ & & | & & | & & \\ & & H & & H & & \end{array}$$

Replacing one H by H–O, we have

$$\begin{array}{ccccccccc} & & H & & H & & & & \\ & & | & & | & & & & \\ H & - & C & - & C & - & O & - & H \\ & & | & & | & & & & \\ & & H & & H & & & & \end{array} \quad \text{or} \quad C_2H_5OH$$

Methyl alcohol, or wood-spirit (CH_3OH), is derived from methane, or marsh-gas (CH_4), in a similar manner. Numerous other alcohols have been prepared from the hydrocarbons of the marsh-gas series, the one best known being amylic alcohol, or fusel oil ($C_5H_{11}OH$), which is often present in distilled liquors, and, when occurring in any notable quantity, is a very deleterious and unwholesome ingredient. The alcohol used in the arts is always obtained from glucose by a process of fermentation, but it has also been made in the laboratory by the direct union of its elements, thus proving the connection between the so-called organic and inorganic bodies, and showing that a living plant or animal is not necessary for the formation of the first-named class, as was formerly supposed. A curious property of alcohol is that of uniting as a whole with certain crystalline bodies, just as water does when in the condition of water of crystallization. Calcic chloride unites with alcohol in this way, forming an alcoholate, with the formula ($CaCl_2$) 4 (C_2H_6O). Each alcohol, by further oxidation, is transformed into a substance known as an aldehyde, but which is of interest only from a theoretical point of view. Common alcohol, for instance (C_2H_5OH), is converted into ethylic aldehyde (CH_3COH) by removing two atoms of hydrogen. A still further oxidation converts the aldehydes into acids, many of which are of much importance. Ethylic aldehyde (CH_3COH), for example, is easily oxidized into acetic acid (CH_3CO OH), which is the acid present in vinegar. Butyric acid, from butyl alcohol, is too often present in rancid butter; while the medicinal value of valerianic acid is well known. The fatty acids used in soap and candle making also belong to this family or series. Sulphur and oxygen are closely related chemically, and often replace each other in compounds of a similar nature, and so we find alcohols in which the atom of oxygen is replaced by one of sulphur. The best known of these is mercaptan (C_2H_5SH), corresponding to common alcohol. It unites directly with mercuric oxide to form a solid body, whence its name; but its most evident characteristic is its horrible odor, which renders any investigations upon it a form of scientific martyrdom. Returning to the base of common alcohol, ethane (C_2H_6), there would seem to be no reason why two atoms of hydrogen might not be replaced by an equal number of hydroxyl radicals, and we find that such is the case. These diatomic alcohols, or glycols, as they are called, are well known, but are rather difficult to prepare, and have no practical value. Ethylene glycol ($C_2H_4\,[OH]_2$) corresponds to common alcohol. If we replace three hydrogen atoms of the original hydrocarbon by hydroxyl, we obtain a class of triatomic alcohols, or glycerines. Common glycerine is a triatomic propyl alcohol ($C_3H_5\,[OH]_3$), and is the only one of the series having any particular value. Hexatomic alcohols, containing six hydroxyl radicals, are known, the most familiar being the sweet principle of manna, or mannite ($C_6H_8\,[OH]_6$). Carbolic acid, or phenol, is really an alcohol, derived from the benzol or aromatic series of hydrocarbons; benzol (C_6H_6) giving phenol ($C_6H_5\,[OH]$). Like common alcohol, phenol may be oxidized further to an aldehyde and an acid, the latter being the well-known benzoic acid. The hydrogen atom in the hydroxyl can also be replaced by other atoms or radicals. A most important instance of this is shown in the manufacture of ether from alcohol, where the hydrogen of the hydroxyl is replaced by another ethyl radical; thus alcohol (C_2H_5OH) = ether (C_2H_5, O, C_2H_5). In the commercial manufacture of ether this reaction is accomplished by the action of sulphuric acid upon alcohol. We have given above only a very few of the transformations and derivatives of the bodies known as alcohols, but they are sufficient to show their chemical importance, and also to give a glimpse at the most difficult and complicated subject of organic chemistry. We might have spoken, in addition, of the primary, secondary, and tertiary alcohols, and their normal, iso, and para modifications. When we consider that these numerous forms are subject to every possible change in the way of combination, substitution, and addition of other elements and compounds of elements, without altering the original radical or skeleton on which the molecule is built up, we can begin to realize what an infinite number of combinations of carbon, hydrogen, and oxygen are possible, and that when we have, apparently, analyzed a body into its ultimate elements, we have only just begun to comprehend the mystery surrounding its formation and existense.—*Popular Science News.*

HAPPY THOUGHTS.

LARGE FORTUNES REALIZED FROM SMALL INVENTIONS.

Every little while the newspapers take up the subject of inventions, and tell their readers how many have made fortunes out of small inventions. The Pittsburg *Dispatch* gave the other day a list of small things that have made their inventors wealthy. It commences with the pen for shading in different colors, which yields an income of $200,000 per annum. The rubber tip at the end of lead pencils has already made $100,000. A large fortune has been reaped by a miner who invented a metal rivet or eyelet at each end of the mouth of coat or trousers pockets to resist the strain caused by the carriage of pieces of ore or heavy tools. In a recent legal action it transpired in evidence that the inventor of the metal plates used to protect the soles and heels of shoes from wear sold upward of 12,000,000 plates in 1879, and in 1887 the number reached 143,000,000, producing realized profits of $1,250,000. A still more useful invention is the "darning weaver," a device for repairing stockings, undergarments, etc., the sale of which is very large and increasing. As large a sum as was ever obtained for any invention was enjoyed by the inventor of the inverted glass bell to hang over gas to protect the ceilings from being blackened, and a scarcely less lucrative patent was that for simply putting emery powder on cloth. Frequently time and circumstances are wanted before an invention is appreciated, but it will be seen that patience at times is well rewarded, for the inventor of the roller skate made over $1,000,000, notwithstanding the fact that his patent had nearly expired before its value was ascertained. The gimlet-pointed screw has produced more wealth than most silver mines, and the American who first thought of putting copper tips to children's shoes has realized a large fortune. Upward of $10,000 a year was made by the inventor of the common needle threader. To the foregoing might be added thousands of trifling but useful articles from which handsome incomes are derived, or for which large sums have been paid. Few inventions pay better than patented toys. That favorite toy, the return ball, a wooden ball with an elastic attached, yielded the patentee an income equal to $50,000 a year, and an income of no less than $75,000 fell to the patentee of the "dancing jimcrow." The invention of "Pharaoh's serpents," a toy much in vogue some years ago, was the outcome of some chemical experiments, and brought the inventor more than $50,000. The sale of the little wooden figure, "John Gilpin," was incredibly large for many years, and a very ingenious toy, known as the "wheel of life," is said to have produced upward of $100,000 profit to its inventor. One of the most successful of modern toys has been the "Chameleon top," the sale of which has been enormous. The field of invention is not only vast and various, but is open to everybody, without respect to sex or age, station or means.

WAR.

WHAT IT HAS COST THE WORLD IN THIRTY YEARS.

War is the most expensive "amusement" of the modern "civilized" and "Christian" nations. During the past thirty years these refining diversions have cost as follows: Crim an war, $2,000,000,000; Italian war of 1859, $300,000,000; Prusso-Danish war of 1864 $35,000,000; United States war of the Rebellion, North, $5,100,000,000; South, $2,300,000,000; Prusso-Austrian war of 1866, $330,000,000; Russo-Turkish war, $125,000,000; South African wars, $8,770,000; Afghan war, $13,250,000; Servo-Bulgarian war, $176,000,000. All these wars were murderous in the extreme. The Crimean war, in which few battles were fought, cost 750,000 lives, only 50,000 less than were killed or died of their wounds, North and South, during the war of the rebellion in the United States. The Mexican and Chinese expeditions cost $200,000,000 and 65,000 lives. There were 250,000 killed and mortally wounded during the Russo-Turkish war, and 45,000 each in the Italian war of 1859 and the war between Prussia and Austria. War is truly a gentle amusement for "Christian" and "civilized" nations!

ITALIAN DENTISTS.—The Italian government has ordered that only medical men shall henceforth be entitled to practice dentistry and blood-letting—an order which will interfere with a large number of quacks and raise dentistry to so high an altitude that its disciples can no longer hesitate as to whether they belong to a trade or a profession.

PAPER PIPES.—Gas pipes from paper are made from strips of manilla paper equal in width to the length of the pipe to be made, which is passed through a vessel with melted asphalt and then wrapped firmly and uniformly around an iron core until the required thickness is attained. The pipe is then subjected to powerful pressure, after which the outside is strewn over with sand and the whole cooled in water. The core is then removed and the inside of the pipe coated with a waterproof composition. These pipes are claimed to be perfectly gas-tight and much cheaper than iron pipes, and very resisting to shocks and concussions.

MIND AND MATTER.

THEIR RELATIONS IN SCIENCE AND PHILOSOPHY.

In whatever department of thought we find it occupied, the very nature of science is hostile to uncertainty. Facts, indeed, are not its constant possession, but its object, nevertheless, is always to know the truth as true beyond possibility of doubt. Nothing, therefore, can, in strict conformity with its character, be received on mere trust. All that is accepted must be capable of proof, and anything that cannot be thus verified, though true it may be, is to science a thing not known. In reference to all such matters, its position is that of the agnostic, properly so called, not, that is to say, of a mere creedless bigot, but of an expectant and cautious investigator, accepting in belief only that which he has proved. In virtue of this very position, however, the description here given is but a partial one. It applies rather to a purpose than an actual condition. It is a true portrait of exact science only, and it leaves untouched the illustration of that far-reaching principle by which every branch of knowledge is made subject to the law of development, and passes through doubts, conjectures and shrouded truths to the brightness of clear understanding. Science is no exception to this rule. It has its tentative theories, its mutable facts and provisional acceptances, and its position would be logically untenable if it were to deny to other modes of thought a share in that charitable consideration which allows time for its own conclusions, however crude, to be planned, marred, recast, and slowly matured. The assumption of such a position would indeed be suicidal, for it implies a fatal schism among the forces concerned in philosophic inquiry. Science and philosophy, it must be remembered, are not contraries. They are merely the obverse and the converse of the same intellectual process, the former objective, the latter subjective as to its rational method. Either may, in the wider acceptation of its meaning, be taken to include the other, and it is only the prominence of one, the physical application of scientific study, which has associated the former with what we call matter, as distinct from spirit or mind, the natural sphere of the latter. However diverse they may seem to be, distinction between mind and matter is, in the present state of our knowledge, impossible. We are as yet without experience or information respecting the separate condition of one or another. At all points matter is instinct with incorporated properties which constitute the law of its being, though whence derived its atoms cannot tell us; and mind, on the other hand, can only confess itself through its physical manifestation. Though we should penetrate, if it were possible, beyond the earliest known traces of our world, we might still be as far as ever from a solution of the mystery, but at no stage could we expect to pass beyond the age at which these two became united. Everywhere we still find, whether in vital activity or in the buried vestiges of world-old existence, the sure signs of cause and effect. The design may vary, but its evidences are never wanting. Some, perhaps, may prefer to regard it as the essential possession of matter, and to dignify this with the attributes of a creator. We cannot but think, however, that the very diversity of material forms, and their infinite variation in conformity with some discoverable purpose in each case, mark them out rather as the vehicles of some compelling force implanted in them. That this force is not purposive, but fortuitous in its action, is incredible. Given a certain stage in the progress of development, circumstance may, indeed, accomplish many modifications, as the laborious genius of Darwin has abundantly proved; but even these are governed by strict limitations, are apt to be transient in character, and are rather differences of degree than alterations in type. The argument for intelligent design is not seriously impaired, in our opinion, by such evidence of a merely material agency, and there is every reason to believe that this view is yearly gaining ground among the more scrupulous thinkers in physical science. It is significant to find an authority like Professor Tyndall, despite his belief in matter and force as primary factors in the production of life, admitting the probable existence of a "power of creation," which he associates with evolution, and proposes to invest with some feeling akin to worship. Professor Huxley's condemnation of materialism as "the most baseless of dogmas" is also—at least constructively—suggestive of a disposition to include within the beliefs of natural sciences the existence of a supreme directing intelligence.—*Lancet.*

WORK AND REST.

A PHYSIOLOGICAL VIEW OF THE EIGHT-HOUR MOVEMENT.

The human body is a machine for the production of power by the oxidation of hydrocarbon compounds in the shape of food, just as a steam engine effects the same results, more economically, by the oxidation of similar substances in the shape of wood or coal. But an important difference is, that, while a steam engine will run continually if supplied with fuel, the human organism can only work for a comparatively short period of time, when it must stop until, in the mysterious state of semi-existence known as sleep, the exhausted tissues are repaired, and the supply of the incomprehensible force renewed. The modern tendency of the so-called "reforms" in the conditions governing the performance of labor is in the direction of shorter hours, that is, the performance of less work for the same wages, rather than in increased pay for the same amount of work. From an economical point of view, either plan amounts to about the same thing, but the effect upon the individual workman is very different. A definite amount of work will always command a definite price, depending upon the condition of the labor market, which is governed by the laws of supply and demand in exactly the same way as the wheat or cattle markets; and it is mathematically impossible that a man can, for any length of time, obtain as high a rate of wages for eight hours' work as he can for ten hours, unless by some means he is able to produce as much in the eight hours as he previously did in ten. The advocates of the eight-hour day claim that this is the case, and that, owing to the physical exhaustion produced by ten hours of toil, no more work is accomplished in this time than in eight hours, with the increased mental and physical vigor arising from a shorter period of activity. It is evident that there must be an average daily time of labor in which the greatest amount of work may be produced. It would be impossible and uneconomical to work, say twenty hours a day, and equally wasteful to only devote one hour or less of each day to labor. It may be safely assumed that the average man will endeavor to so regulate his work as to produce the greatest possible daily amount, and, although unconsciously, yet none the less certainly, will an independent worker strike a very accurate balance between the production of energy in his body in his hours of rest and its dissipation in his hours of labor. The question of a shorter period of labor, then, resolves itself into one of the natural strength and vigor of the laborer. For many years ten hours a day in the mechanical trades has been considered as the most economical period—that is, the time in which the greatest amount of daily production may be accomplished. The general adoption of an eight-hour working day would, therefore, indicate one of three things: either the average of human strength and vigor has been reduced by one-fifth, or that there has been for many years past an entire misapprehension as to the proper balance between work and rest, or, what is more improbable than either, that the great majority of men are willing to voluntarily accept a reduction of 20 per cent. in their wages—for that is what it would inevitably amount to—for the sake of more leisure time. The indifferent success of the eight-hour movement, which seems to have been the work of professional agitators, whose only occupation is to stir up strife between employer and employed, would indicate that the ten-hour day is founded upon a scientific physiological basis, and that, in the mechanical trades at least, the energy produced in the average human body in twenty-four hours can be most profitably and economically dissipated in ten.—*Pop. Science News.*

EARLY ELECTRICAL EXPERIMENTS.

WHEN WAS THE ELECTRIC TELEGRAPH SUGGESTED?

The claims and counterclaims that are occasionally made as to the priority of invention or discovery have led to a great deal of controversy, says the *Manufacturers' Gazette*, and it becomes a difficult matter to establish the claim or fix with any degree of certainty the credit for the matter. There are very good reasons to doubt the claim of Bell to the original conception of the electrical transmission of sound, and other instances equally doubtful are numerous. While Prof. Morse is credited with the invention of the modern telegraph, and it may be believed by many that prior to his invention and successful experiments such a means of communication was not only unknown but unthought of, there are historical facts which show that such is not the case, and it is even possible that such means were in use about the time of Galileo, as indicated by what appeared in one of his works, written in 1632. He puts into the mouth of one of his characters a reference to a secret art by which, through the sympathy of a magnetic needle, it would be possible to converse across a space of 2,000 or 3,000 miles. This would tend to show that possibly telegraphy is one of the lost arts, or was at least something more than a mere dream of the ancient philosopher. Pursuing the subject still further, we find that in the *Scots Magazine* of February, 1753, about the time that Franklin made his discoveries in connection with electrical currents, a writer signing himself "C. M." made the following communication, which is indeed interesting in connection with electrical science as known and developed at the present time. The article appears under the head of "Electricity—An Expeditious Method of Conveying Intelligence by It," and reads as follows: "It is well known to all who are conversant in electrical experiments that the electric power may be propagated along a small wire, from one place to another, without being sensibly abated by the length of its progress. Let then a set of wires, equal in number to the letters of the alphabet, be extended horizontally between two given places, parallel to one another, and each of them about an inch distant from that next to it. At every twenty yards end let them be fixed in glass, or jeweler's cement, to some firm body, both to prevent them from touching the earth, or any other non-electric, and from breaking by their own gravity. Let the electric gun barrel be placed at right angles with the extremities of the wires and about an inch below them. Also, let the wires be fixed in a solid piece of glass at six inches from the end, and let that part of them which reaches from the glass to the machine have sufficient spring and stiffness to recover its situation after having been brought in contact with the barrel. Close by the supporting glass let a ball be suspended from every wire, and about a sixth or an eighth of an inch below the balls place the letters of the alphabet, marked on bits of paper, or any other substance that may be light enough to rise to the electrined ball, and at the same time let it be so contrived that each of them may reassume its proper place when dropped. All things constructed as above, and the minute previously fixed, I begin the conversation with my distant friend in this manner: Having set the electrical machine agoing as in ordinary experiments, suppose I am to pronounce the word, Sir; with a piece of glass or any other electric *per se*, I strike the wire S so as to bring it

in contact with the barrel, then I, then R, all in the same way, and my correspondent, almost in the same instant, observes these several characters rise in order to the electrified ball at his end of the wires. Thus I spell away as long as I think fit, and my correspondent, for the sake of memory, writes the characters as they rise, and may join and read them afterwards as often as he inclines. Upon a signal given, or from choice, I stop the machinery, and, taking up the pen in my turn, I write down whatever my friend at the other end strikes out."

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

October.

MEATS.—Beef, mutton, ham, kidneys, liver, venison, sausage.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock, brant, grouse, partridge, rabbit, snipe, goose.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, pike, porgie, prawn, rockfish, salmon, sea bass, sturgeon, smelt, turtle, white fish, whiting.

VEGETABLES.—Artichokes, beets, beans, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips, water cress.

FRUITS.—Apples, bananas, blackberries, grapes, melons, oranges, peaches, pears, pineapples.

PRACTICAL RECIPES.

GUMBO SOUPS.—Three quarts of beef, veal or chicken broth, two dozen green okras, two onions, six ripe tomatoes, one cupful of shelled lima beans, salt and cayenne pepper, one pound of cold boiled ham, one large tablespoonful of butter, one tablespoonful of flour; cut the okras into little pieces, slice the onions, slice the tomatoes, and put them all with the broth over the fire; when the vegetables are tender, add the seasonings and the ham chopped in to small pieces; mix the butter and flour together and thicken the soup with them; boil up well, and serve.

OYSTERS AND MACARONI.—Butter a baking dish and put in it a layer of macaroni, add seasonings of salt and pepper and little bits of butter, then add a layer of oysters, then another of macaroni, seasonings, and so on; when the dish is full, pour over all a pint of milk; beat up an egg, mix fine bread crumbs with it, spread it over the top of the dish, and bake a fine brown.

APPLE CUSTARD PIE.—Select two fine tart apples, pare and grate them; mix together four tablespoonfuls of melted butter, eight tablespoonfuls of powdered sugar, the grated rind and juice of a fresh lemon, and the beaten yolks of six eggs; add this mixture to the apples; whisk in lightly the well-beaten whites of the eggs; line a plate with puff paste, fill with the custard, and bake.

SOFT GINGERBREAD.—One cupful of butter, 1 cupful of sugar, one cupful of sour cream, two eggs, one cupful of molasses, one tablespooful of ginger, one and a half teaspoonfuls of cinnamon, one teaspoonful of soda dissolved in hot water, one-quarter teaspoon of salt, flour enough to make a good batter (about four and a half cupfuls); mix well, beat thoroughly, and bake in a square dripping pan.

FIXED-OVER BEEF.—Mince fine some cold beef, season it highly, add to it enough stock to moisten it and some finely chopped pickled walnuts, or Worcestershire sauce; butter some scallop shells, fill them with the meat, spread mashed potatoes over them, sprinkle on bread crumbs, and over all put little bits of butter. Brown in the oven, and serve very hot.

CORNMEAL GRIDDLE CAKES.—Mix sufficient cornmeal with one pint of milk to make a good batter, add one well beaten egg and one-half teaspoon of baking powder and a pinch of salt. Bake on a very hot greased griddle.

BOILED VEGETABLE SALAD.—Take equal portions of cold boiled celery, cauliflower, cabbage and potatoes, and cut them into small pieces. Make a salad dressing (Mayonnaise or French), adding a little onion; pour it over the vegetables; mix lightly, and serve. Nearly any vegetable may be used.

WORTH KNOWING.

SOME PRACTICAL HINTS TO HOUSEKEEPERS.

That burned camphor will drive away mosquitoes.

That roasted coffee is one of the most powerful disinfectants.

That lard may be made perfectly sweet by boiling a pared potato in it.

That cistern water may be purified by charcoal put in a bag and hung in the water.

That salt will remove the stain from silver caused by eggs, when applied with a soft cloth.

That a tablespoonful of turpentine boiled with white clothes will greatly aid the whitening process.

That hot, dry flannels applied to the face and neck is a very effective remedy for a "jumping toothache."

That fruit or rust stains on table linen or other white cloths may be removed by soaking in a weak solution of oxalic acid.

That hard waters are to be preferred to soft waters in the teapot, as the hard waters dissolve less of the tannin of the leaves.

That after tea has been steeped in boiling water for a few minutes a large proportion of the valuable constituents are extracted.

That the most effectual remedy for slimy and greasy drain-pipes is copperas dissolved and left to work gradually through the pipe.

That plaster of Paris ornaments may be cleaned by covering them with a thick layer of starch, letting it dry thoroughly and then brushing with a stiff brush.

That a room crowded to discomfort with furniture and ornaments, no matter how costly, is never restful and homelike, and always suggestive of the shop or the museum.

That old feather beds, by putting them upon a clean grass plot during a heavy shower, permitting them to be thoroughly wet through and then dried and beaten with light rods, will freshen and enliven the feathers.

That a dark and gloomy room may be brightened by placing ebonized shelves over the doors and windows, grouping scarlet, yellow or gilded fans upon the walls, and placing pretty bric-a-brac and vases in positions where they will be brought into relief by the cheerful background.—*Woman's News.*

THE KIDNEY, A MIRACLE.

How many readers have examined a kidney? For purposes of study and reflection, that of a lamb or calf is as valuable as that of a human being. The latter is, undoubtedly a more complex and wonderful organ; but most of its mechanism is the same as that in either of the former. It will be noticed that it is encased in a hard and elastic fat, we call suet. This protects it far more than if it were surrounded by muscles. The latter are subject to strains and colds, to irritation and inflammation. Suet is less liable to any and all ills than any other tissue in the body. The next point to be observed is that there are nerves running from the kidneys to the brain. They are not the ordinary nerves, with which the senses announce pain and pleasure, or the mind directs muscular action. They convey power to the kidneys, and at times report to the brain that there is danger in that part of the system. The pain with which this message is accompanied, though not acute, is deep and exhausting. Whoever has suffered it once knows how quickly the entire body takes notice of the trouble. After the nerves are the two blood-vessels, which carry the blood of the whole system to be filtered by the kidneys, and then return it to the circulation. Last, and most interesting of all, is the structure of the kidney itself. Under the naked eye, it is a strong, elastic and beautiful tissue, one of the handsomest in the body. Under the microscope, the smooth surfaces resolve themselves into thousands of cells, ducts and pipes. It has been figured by some physiologist that these little tubes would make a pipe line, if put together end to end, over a hundred miles long.

The kidneys are faithful workers. Day and night unceasingly they are laboring in their own way. From the blood, by some unknown chemistry, they separate and remove water, alcohol, lime, iron, urea, uric acid, choleic acid, worn-out albumenoids, injurious vegetable principles, and an endless list of substances. Most of the matter they filter out is the *debris* of the body; some of it is of foreign elements introduced into the system, and some of it is the product of disease or of morbid conditions of the organization. They are thus one of the great safety-valves of the physical machine. They are the last function to weaken; but when they do succumb to overwork, exhaustion or disease, the result is always critical, too often fatal.

It is impossible to be too careful in regard to their condition. They show the condition of the body within. If the water they filter is too red or contains traces of blood; if it is cloudy or suffused with albumen; if it is acrid, over saline or scalding; if it is muddy, brown or of greenish hue; if it contain minute specks of mineral substances, or concretions of any sort; if it is of unnatural odor, or devoid of color and odor; in fact, if it vary in any way from the normal, you may rest assured that the system is in bad condition, and ere long, unless something is done, disease and suffering are bound to appear. Excepting in those cases where fruits, green vegetables, alcoholic beverages or excessive drinking have been the cause of the trouble, the source of the difficulty lies exclusively in the blood. Even when the kidney is in bad condition, it has been brought there by the depraved state of the fluid it is compelled to filter.

Excepting when there is reason to suspect serious disease, the only thing to be done in all these instances is to take Ayer's Sarsaparilla, and thereby cleanse the circulation and tissues, restore the tone of the kidneys and the normal character of their excretion. Hot or, rather, lukewarm baths are a good assistant, as is also a mild aperient, such as a fruit diet, or Ayer's Cathartic Pills. The one increases the activity of the pores and lungs, while the other, by stimulating the excretory function, scours the system and still further lessens the strain upon the kidneys. Following these directions will put a quick stop to these unpleasant symptoms and soon bring back lost vigor and well-being. Let it be borne in mind, however, that the most important weapon in the war against all of these complaints is Ayer's Sarsaparilla. Without it, there is long waiting and litttle hope; with it, there is certain victory.

NATIONAL NEEDS.—The United States, with only one-twentieth of the earth's inhabitants, consumes from a quarter to a half of the earth's great staples. For instance, the United States consumes 28 per cent. of the sugar, 30 per cent. of the coffee, 34 per cent. of the wool, 25 per cent. of the cotton, 34 per cent. of the india-rubber, 51 per cent. of the tin, 40 per cent. of the coal, 34 per cent. of the iron, 34 per cent. of the steel, 30 per cent. of the copper, and 35 per cent. of the lead produced yearly in the world.

BUSINESS NOTES.

HORSFORD'S ACID PHOSPHATE.

Dr. O. C. Stout, Syracuse, N. Y., says: "I gave it to one patient who was unable to transact the most ordinary business, because his brain was 'tired and confused' upon the least mental exertion. Immediate benefit and ultimate recovery followed." For indigestion, dyspepsia, and diseases incident thereto. Beware of imitations.

A GREAT BUSINESS.

The lamp business may be classed as one of the great industries of the country. Within a few years a great change has taken place in the business. Glass and crockery lamps have given way to bronze, iron and brass. In Connecticut alone the following cities and populations are largely engaged in the manufacture of bronze and brass lamps: Meriden, 22,000; Waterbury, 30,000; Birmingham and Ansonia, 20,000; Bridgeport, 50,000; total, 122,000 people. The business has increased immensely since the "Rochester" bronze lamp was introduced, with its perforated cone burner, about five years ago. There are over two million Rochester lamps in use, and over half a million a year are regularly sold.

FINE PRESERVES.

Twenty-five years ago the only preserves in the market were coarse, old-fashioned goods, which, however wholesome, were not over-palatable and certainly not too appetizing in appearance. At that time the demand for sweetmeats increased, and as a result two tendencies became immediately visible. The one was towards cheapness rather than quality, and culminated in the production of jellies which were composed of vegetable gelatine, chemical flavors and artificial dyes, and of preserves made from the poorest fruits and the commonest glucose. These are turned out to-day in vast quantities and are found in nearly every store of the land. While most are pleasant to the taste, none are nutritious, and a large number are very deleterious, some, indeed, being dangerous to health and even life. The other tendency was towards quality rather than cheapness, and culminated in the production of the finest preserves known to the world. Pure fruit jellies, in which all the fragrance and flavor of the original are contained; jams and marmalades, that are both charming to the eye, nostril and tongue and beneficent to the stomach; preserved fruits, that are even more delicious than those in their natural state, are the final outcome with which the United States has carried off medals and honorable mentions in every great exposition. In this movement the chief credit is due to Gordon & Dilworth, New York City. They started this line of business, and to-day justly retain the pre-eminence they earned long ago. Their goods still remain the best not only in this country, but in the world.

CLOVES.—The chief industry of Zanzibar and Pemba is clove-growing. The tree was introduced in 1830, and the harvest this year is expected to be 13,000,000 pounds, at an average local value of ten cents a pound. A ten-year-old tree is capable of yielding twenty pounds of cloves; trees of twenty years often yield upward of 100 pounds.

MINUTE MARVELS.—The nature of bacteria was for a long time doubtful, but it has recently been determined that they are vegetable, rather than animal, occurring in four forms—spheroidal, ovoidal, rod-shaped and spiral. So minute are they that 1,500 of them, placed end to end, would only cover a space equivalent to one-quarter the head of a pin. They are composed of a granular watery mass surrounded by thickened walls. A drop of water is the ocean in which they live. Among their various functions is included a marvelous power of reproduction; in twenty-four hours one bacterium will produce over 16,000,000.

MINERAL RUBBER ASPHALT.—Another article formerly considered worthless has been added to the useful products, and is known and is called mineral india rubber asphalt. It is produced during the process of refining tar by sulphuric acid, and forms a black material very much like ordinary asphalt, and elastic like india rubber. When heated so that the slimy matter is reduced to about 60 per cent. of the former size, a substance is produced, hard, like ebony. It can be dissolved in naphtha, and is an excellent non-conductor of electricity, and therefore valuable for covering telegraph wires and other purposes where a non-conducting substance is needed. Dissolved, the mineral india rubber produces a good water-proof varnish. The manufacture of the material is very profitable and pays the inventor 400 or 500 per cent.

ANOTHER VISIONARY.—A Boston electrician and mechanic has invented a small machine with which he expects to solve the problem of perpetual motion. The machine works automatically. On a metallic hub there are eleven glass tubes, perfectly air-tight, partially filled with a fluid, which flows from the hub to the ends on one side, and from the ends to the hub on the other, keeping the apparatus constantly out of a state of equilibrium, which keeps the hub and spokes revolving on a screw axis. The screw axis turns on centres, forming a diameter to a horizontal metallic ring which is supported by four small glass pillars to show that no outside force is secretly transmitted to the machine.

EFFECTIVE PROJECTILES.—The range and penetrating power of the modern rifles are tremendous. The six-inch rifle will hurl its projectiles through ten and a half inches of wrought iron a thousand yards from the muzzle. The eight-inch rifle will pierce sixteen and three-tenths inches of iron at the same distance. The ten-inch rifle that the rejuvenated Miantonomoh will carry will send its missile through twenty-one inches of iron a thousand yards away. The twelve-inch rifle, of which we are to have a supply in the future, will penetrate twenty-eight inches of iron at a range of three thousand feet.

ELECTRIC VOTING.—The House Committee on Rules, at Washington, recently gave a hearing to J. A. Enos, an inventor, who asks to have an appropriation of $60,000 made to defray the cost of installing his patent electric voting machine in the House of Representatives. Mr. Enos explained the working of his machine, and brought to the attention of the committee some facts to demonstrate its probable utility and economy. He stated that during this session there have been over 300 roll calls, each consuming thirty minutes, or an aggregate of thirty working days, and he asserts by the use of his machine twenty-five days could have been saved. The committee took the matter under advisement.

USEFUL TO MOTHERS.—*Babyhood* for October contains an article on the "Common Disorders of Teething-Time," which the writer, Dr. John Dorning, contends are in most cases not related to the process of teething. He exposes very strikingly some of the fallacies entertained on this subject, while giving useful hints to the mothers of teething infants. "Massage," by Dr. Sarah E. Post, is probably the first popular article that has appeared on this subject, which is attracting increased attention, especially in connection with certain disorders of infancy. The article is profusely illustrated, and gives explicit directions as to the various kneading motions. "The Mother's Parliament," "Baby's Wardrobe," "Nursery Problems," and other departments are well represented in the last number of this mothers' magazine.

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ELECTRICAL HANDWRITING.

It hardly pays to be astonished at anything in these days of progress. Accordingly, the introduction into practical use of a device which enables a person to transmit by telegraph not simply the words of a despatch, but a message in the exact handwriting of the sender, should not be regarded as anything extraordinary. The only thing, apparently, left for us to exercise our faculties of wonderment over, is in regard to what phenomena of scientific achievement the generation that follows us will produce. The writing telegraph referred to seems to be a realization of the "Telautograph" described in the AMERICAN ANALYST several months ago. Technically, it may be described as transmitting from one station, and receiving at another, the compound movement of a point in two directions, one at an angle to the other. The working parts of the instrument are placed in a case about 12 inches long, 10 inches wide and 8 inches deep. On top of the case are the paper, the receiving pen for recording the message, and the handle of the transmitting stylus for writing. A message may be received with the case open or shut, the presence of an attendant being unnecessary. When the instrument is to be used in private residences or offices, it is mounted in a handsome desk. The manner of writing is as follows: The sender of the message takes hold of the stylus rod, and, watching the recording pen, makes it form what letters he wishes, and the receiving pen of the distant instrument also makes a *fac-simile* of every letter or mark. The pen follows every movement of the stylus rod, stopping where it stops and moving when and where it moves. If the stylus is moved to the right, the pen moves to the right. If the stylus is given a downward pull, the pen makes a downward stroke. If a curve, the pen makes the curve. It is said to take but a few minutes to get used to the moving paper and to form the letters without moving the hand to the right. That is all there is to learn to operate the instrument. It is soon found that pulling the pen electrically, by means of the stylus, is a very easy way to write, and many claim it is easier than writing directly on paper with an ordinary pen. It has its advantages, too, in the simplicity of the instrument when thus constructed. The characteristics of the handwriting of the operator all appear. The instruments have been in use for some time, and are reported to have proved very successful. The device is certainly very ingenious, and may prove to be very useful, as its possibilities are almost incalculable.

DR. KOCH'S SUCCESS.

The continued investigations of the learned Dr. Koch in the subject of the germ origin of consumption seem likely at length to reach a successful result. At least that is the hopeful view of the subject taken by the scientist himself. For a long time he succeeded in arresting the growth of tubercle bacilli in tube culture only, his experiments constantly failing when tried on tuberculous animals. But he patiently persevered in his search for growth-hindering remedies, until now he announces that he finally has found them. Let him speak for himself, however: "I have at last hit upon a substance which has the power of preventing the growth of tubercle bacilli, not only in a test tube, but in the body of an animal. All experiments in tuberculosis are, as every one who has had any experience of them has sufficiently discovered, of very long duration; my researches on this substance, therefore, although they have already occupied me for nearly a year, are not yet completed, and I can only say this much about them, that guinea pigs, which, as is well known, are extraordinarily susceptible to tuberculosis, if exposed to the influence of this substance, cease to react to the inoculation of tuberculosis virus, and that in guinea pigs suffering from general tuberculosis, even to a high degree, the morbid process can be brought completely to a stand-still, without the body being in any way injuriously affected. From these researches I, in the meantime, do not draw any further conclusions than that the possibility of rendering pathogenic bacteria in the living body harmless without injury to the latter, which has hitherto been justly doubted, has been thereby established."

COMPOUND LARD.

Congress at its recent session left a considerable amount of unfinished business, to be "resumed in our next," as the ladies' magazines express it. A lively correspondent of the *Commercial Bulletin* of this city is worked up over the idea of the Conger Lard bill, being one of those incomplete elements of disturbance whose consideration is to be soon entered upon again by our national legislators. The disfavor with which he regards the hog lobby may be gathered from his denouncing them as "sharks who will navigate around consuming the time which should be devoted to the consideration of broad, national questions and the public interests with their one-sided, selfish and unconstitutional legislation on the subject of lard." The issue generally is tolerably well, even if somewhat clumsily set forth as follows: "The packers who have for years conducted the nefarious business of branding a mass of unsavory products as 'pure lard,' whose iniquitous practices have been brought to light in consequence of the extensive marketing of a product which has been shown to be, and is conceded to be, vastly superior in point of purity and consequent healthfulness, viz.: lard compound, finding that this enlightenment of the public threatens the overthrow of their business and the competition of the pure article ruinous, come to Congress for help and pray for relief at the expense of the health and the pockets of the people at large." His succeeding comments upon the risky policy of passing such a bill would have applied with even greater force to the oleomargarine bill a few years ago, whose passage paved the way for the adoption of, who can foresee how much similar iniquitous legislation? Never has there been introduced into the House of Representatives a bill so fraught with dangerous possibilities. The disastrous consequence of the passage of such a measure would be far-reaching and would jeopardize all classes of business by loading it with complications and legislative restrictions which would increase the expense of its conduct and decrease its profit. The matter is finally summed up in the following forcible and truthful words: "As a matter of fact, the Government has no right to interfere with these trade matters. They are entirely outside of its functions. It has no constitutional right to take sides with one class of manufacturers as against another. If it is right in this case, then it will be right for the manufacturers of any other article in any section of the

country who may feel the effects of sharp competition in their line of business, to hie to Congress and, by means of political or other influence, secure the passage of measures to annihilate the business of their competitors. Furthermore, it will encourage the introduction of other bills having for their object the placing of other great staple industries under Government control. In fact, it is not difficult to conceive the great extent to which this practice may be multiplied, though it is hard to say within what limits this interference by the Government with mercantile affairs will be confined.

COFFEE INEBRIATES.

The Germans are notable coffee drinkers, and it would seem as though some of them had carried their fondness for that beverage to a dangerous limit. A Prussian physician named Mendel has published in Berlin an essay on Coffee Inebriety. His observations were confined to the working population. He found that large numbers of women consumed over a pound a week, and some men considerably more, besides beer and wine. The leading symptoms were profound depression of spirits and frequent headaches with insomnia. A strong dose of coffee would relieve this for a time, then it would return. The muscles would become weak and trembling, and the hands would tremble when at rest. An increasing aversion to labor and any steady work was noticeable, the heart's action was rapid, irregular, and palpitations, and a heavy feeling in the præcordial region were present, also dyspepsia of an extreme nervous type. The symptoms constantly grow worse and are only relieved by large quantities of coffee, generally of the infusion; in some cases the tincture was used. The victims suffer so seriously that they dare not abandon it because of the fear of death. Where brandy is taken only temporary relief follows. The face becomes sallow and the hands and feet cold, and an expression of dread and agony settles over the countenance, only relieved by using strong doses of coffee. Melancholia and hysteria are present in all cases. Happily in this country the average housekeepers and cooks are so incapable of preparing coffee in the proper manner that there is little danger of persons becoming so inordinately fond of drinking it as to risk their health in coffee tippling.

ASTRONO Y DRAMATIZED.

A POPULAR SCIENCE THEATRE IN BERLIN.

(Prof. Rufus B. Richardson in the *Independent*)

Germany is not generally looked upon as the land of novelties; but Berlin possesses one novelty so important that it seems worthy of attention and description. Every day one sees on each of the several thousand large wooden columns standing at almost every street corner, along with the other theatre announcements, the following: "Urania, in the Science Theatre (*Wissenschaftliches Theatre*), at 8 P. M.; The Primeval World;" or, on another day, "The Journey from the Earth to the Moon." If one follows this standing invitation, he will see something interesting. If he chooses the "Journey to the Moon," he will find that he has a popular lecture on astronomy actually put upon the stage. In the place of actors, to be sure, one finds a single reader or declaimer, who mounts a desk in front of the curtain and gives the lecture to the audience; but all the scenic effects which the stage affords are called in to aid the lecture. After a short prologue on the purpose of the lecture, the curtain rises on a scene near Berlin on the morning of the last great eclipse of the sun, August 19, 1887. Morning twilight comes on. The world begins to stir in anticipation of the usual sunrise, whan lo! in the place of the usual sun, up comes a blood-red sickle, which soon disappears, and weird lights appear around a black disk. Nature is shrouded in a veil worse than pitch darkness. Animals feel the terror which men, uninstructed to look for such a phenomenon, used to feel. The tension is soon relieved by the reappearance of the sickle reversed, and the gradual passage into an every-day light. The lecture all the while proceeds, explaining the cause of the strange phenomenon, *i. e.*, that the moon has come between the earth and the sun. Attention being thus fastened upon the moon, the spectators are made to approach that body by successive scenes. The next scene affords a look at the earth from a point of view in space at some distance from it. We now see how the same eclipse appears from this point, and see the shadow of the moon sweeping over a small area of the great revolving globe, moving eastward from Berlin over the Russian border, taking its course between St. Petersburg and Moscow into Asia, where we leave it on the dropping of the curtain. In the next scene one sees an eclipse of the moon from a point in space where he beholds both earth and moon in their relative size, and sees the moon pass into the broad shadow of the earth. Thus by two successive stages one is brought nearer the moon, until he sees it as the most powerful telescopes present it. With the mountains all spread out before the sight, a disquisition on the moon's surface is intelligible and impressive. Not to give every detail, one is at last introduced to the surface of the moon itself. The grandeur of that dead world is an impressive scene. Then comes a scene representing the moon by earth light, corresponding to our moonlight night, resolved into sunlight at the close of the scene, as the sun rises wasting his glory on those desert fields. Then we are shown an eclipse of the sun as seen from the surface of the moon, or how things look there on the occurrence of what we call an eclipse of the moon. Returning to the earth with a comfortable "home again" feeling, but with a new interest in all the operations of our satellite, we have a magnificent scene in the High Alps, sunset, evening glow, and following eclipse of the moon, in which the disk is seen still dull red in the earth light, which we had already seen surrounding us when we witnessed from the moon the same occurrence, or what there appeared as an eclipse of the sun by the earth. Then comes the closing scene, a sunset in St. Paul, a volcanic island of the Indian Ocean, accompanied by a comparison of the so-called volcanoes of the moon with those of the earth. The scene painter has exhausted his art to leave on the mind of the spectator an impression of the glory and beauty of earth encircled by sea and sky and lighted by the glorious sun. The two hours' instruction closed with an appeal to the feelings. The same chords are touched upon which great Nature plays in summer evenings when we have all felt more than we can express. The other representation, "The Primeval World," a lecture on geology, is incomparably more effective in its scenic display. The twelve scenes present the world in its various conditions from primeval chaos down to the present, with the convulsions through which it passed. It would be tedious to catalogue each scene. Particularly grand is a "Volcanic Outbreak of the Devonian Age," which changes the whole face of nature. Impressive also are the "Forest of the Carboniferous Age," and a "Jurassic Landscape," with its giant lizards. When the eleventh scene presents the "Lake of Zurich," with the morning sun rising upon a simple community of lake dwellers, one feels that the reign of monsters is over, and wants to rise and shout "Hurrah for man!" But when a Mediterranean shore is introduced crowned with eloquent ruins, and pensive music fills the air, the feelings are toned down, and the spectators are sent home in somewhat of that quiet, thoughtful frame of mind in which the old Greek tragedy was supposed to leave them. The story of the origin of the Urania Institute, of which the theatre is only one branch, is a very interesting one. Some years ago Professor Forster, the director of the Berlin Astronomical Observatory and a professor in the university, was troubled by the great number of people, not students, who wished to look at the moon and other heavenly bodies through the observatory telescopes. It did not seem right to shut them out. Germans always have sympathy with one who "wants to know." The observatory management proceeded in a patient German way to take applications and to accommodate the applicants in order so far as possible. But the calendar became clogged with applications six months in advance. Professor Forster appealed to the government, the first and natural resort of a German, for an appropriation to set up telescopes in a separate building, to supply the evident demand. He failed to secure the appropriation After this there gradually matured in his mind and the minds of several of his associates the idea of an institution of popular instruction, with not only telescopes but a great quantity of physical apparatus. Then came the thought of calling in that great auxiliary, the stage. Thus what, as a benevolent enterprise confined to the simple scope of giving people a chance to look through telescopes, was about to be abandoned for lack of funds now became a promising financial venture. A stock company was formed, and the result was the Urania. It has already been in operation a year, and has, I am told, paid eight per cent. on the investment Yet so strong is the feeling that an educational institution of this sort should be supported by the State that the proprietors still talk of having the government take it off their hands and give it an assured durability. The actuating motives of the projectors of the Urania were not mercenary. The movement was in *spirit* rather like that of the University Extension movement in England. These men felt that a good deal of the pleasure of the poorer people of Berlin was rather crass. To the minds of many beer drinking has a proper limit, which has been widely overstepped in Germany. Then again, the larger theatres, particularly the Royal Theatre, supported by the government, though powerful educational aids, could not reach the poor, who could not afford to buy tickets. The cheap theatre, on the other hand, furnished often cheap stuff, if not worse. Thus came the desire of a cheap theatre which should at the same time be above reproach and yet be interesting. The institute is open from noon until 11 P. M. In the evening, before the theatrical representation, you may see crowds of Germans who "want to know," investigating microscopes, spectroscopes, phonographs, electric railways—in fact, all sorts of electric and magnetic apparatus, and other apparatus, a catalogue of which would be too long to give. Near each piece are "Directions for Use," and willing directors are also constantly moving about the rooms. The six large telescopes have unfortunately been of little use for most of the summer, as rain clouds hovered over Berlin, dropping rain every day for a month and a half previous to July 14, giving a grim humor to the remark in the "Journey to the Moon" that the view of the moon which is *here* vouchsafed is independent of the weather. It should have been remarked earlier that the eclipse of 1887 is here given as it ought to have been, and not as it actually presented itself. Occasionally, in the place of the stage representation, a regular lecture is given. Dr. Schultz-Hencke gives two lectures on photography on two consecutive evenings, with abundant apparatus and experiments, on the stage. The characteristic feature and the drawing power of the institute is, however, its novel theatre. The lectures that form the basis of the representations are admirably written by Dr. M. Wilhelm Meyer; but they are probably no better than Professor Young could write. In the Urania, however, they go in at the eye as well as at the ear. The scene painter and the declaimer are as important as the writer of the lecture, who intrusts his work to them and does not appear before the audience. The one man who appears to be doing the whole thing is the actor or declaimer. This is Karl Bergmann, who was an actor of good standing, but who regards his present position as an important promotion. With a voice of admirable clearness and flexibility he declaims the lecture as if it were his own, turning confidentially to the audience, using such phrases as "my respected hearers," "I call your attention," etc. If the role which he plays seems

in this description of it insignificant, it is not so in fact. Many good scientific lectures are spoiled by bad delivery The Urania avoids that rock by choosing a man who is a master of the art of delivery.—*The Independent.*

PLATINUM.

ITS OCCURRENCE, VALUE AND UTILITY.

The price of platinum has recently advanced very greatly, until now is is nearly equal in value to gold. In July, 1889, the price was $8 an ounce, six months ago it was $14, and at this writing it is $20 an ounce, while gold is quoted at $20.70. This rapid rise in the value of the metal is due to the steadily increasing demand from the manufacturers of electrical apparatus. Every incandescent electric lamp requires about one inch of platinum wire, and nothing has yet been found to take the place of it. Large sums of money have been expended in the prosecution of experiments having for their object the discovery of a substitute for platinum wire in the manufacture of electric lamps, but without satisfactory results. In the Edison incandescent lamp the copper conductor is attached to a short piece of platinum wire as it enters the glass pear-shaped globe, and the platinum joins the carbonized bamboo loop. The reason why platinum is so indispensable is that metal and glass expand at very nearly the same temperature. If this were not the case, and there was an unequal expansion from the heat of the lamp, the seal of the glass globe would be broken and the light soon extinguished. The history of this metal is most interesting, and its characteristics are very remarkable. During the first half of the sixteenth century it was observed that the gold ore from the mines at Darien, in South America, included grains of a whitish metal, which was deemed to be a noble metal, and yet it differed in a marked degree from silver. The fact of the discovery of this metal was not made known by the Spanish government, because they found that it furnished an excellent material for adulterating gold, and none of it was allowed to be exported. It was only at about the middle of the last century that the metal began to find its way into Europe, where it became known as a curiosity, under the Spanish name of platina del Pinto (the little silver from the river Pinto). The principal source of the supply of platinum is from the Ural Mountains, but it has also been found in the provinces of Choco and Barbacos, New Granada, and in Brazil. It occurs also in San Domingo, on the island of Borneo, in Honduras, among the sands of the Rhine, and in the County Wicklow, Ireland. It is also met with in California, at Rogue River, Oregon, in Rutherford County, North Carolina, and in Canada. The Ural Mountain deposits were discovered about 1823, and they have been worked by the Russian government since about 1828. According to Daubre, the Ural ore was embedded originally with chrome iron in a serpentine derived from olivine. Platinum ore is found in alluvial districts in the debris of the earliest volcanic rocks. It is generally found in small grains, but masses of considerable size have been discovered, and several of these have been preserved as curiosities. The Demidoff museum contains a native platinum lump weighing 21 pounds troy. Humboldt brought a piece from South America weighing 1,088 grains and having a specific gravity of 18.94, and deposited it in the Berlin Museum. In 1822 a specimen from Condato was placed in the Madrid museum which was 2½ inches in diameter and weighed 11,641 grains. When found in its native state, it is in rounded grains or nuggets, or in flattened scales worn smooth by attrition in the gravel of river beds. On the northern coast of California a mixture of gold and the platinum metals in extremely small scales is washed from the beach sand, and from this mixture the gold is removed by amalgamation. From observations made of the rocks and minerals found with platinum in deposits, the theory has been formed that the metal is chiefly derived from the disintegration of serpentine rock. Nearly all the native platinum is more or less magnetic. There are several specimens of this kind in the collection sent to the Paris Exposition in 1867, by Prince Demidoff, upon whose estate in Russia there are a number of places where large masses of the ore have been found. Platinum was coined by Russia to the extent of $2,5000,000 between 1836 and 1864, when the coinage was discontinued. Almost all platinum contains iridium, which greatly increases in hardness and durability without impairing its power of resisting chemical agents, and it has been termed the metal of the chemist. Liebig said that "without platinum crucibles, which share the infusibility of porcelain with the chemical inertness of gold ones, the composition of most metals could not have come to its present level." The unalterability of this metal at high temperatures, and its power of resisting the action of most chemical agents, makes it invaluable for crucibles, evaporating dishes, forceps, and foil for blowpipe experiments. One of its most important uses is for large evaporating stills for the concentration of sulphuric acid. A still of this kind valued at $19,000, exhibited at Vienna in 1873, was capable of concentrating 20,000 pounds of sulphuric acid daily. A well-known oil-refining company located in New York City paid $24,000 for a still of this kind to be used in their business. The joints of these stills are autogenously soldered, thus giving them entire uniformity of material, and making the whole vessel of one piece. It would not, however, be possible to produce such large homogeneous vessels without the aid of the blowpipe. As early as 1837, Dr. Hare, of Philadelphia, proposed to melt platinum, and he succeeded in melting 28 ounces into a malleable, homogeneous mass. MM. Deville and Debray have conducted a number of successful experiments with platinum, so that ingots of large size can now be made. Still another use to which platinum has been put is in the manufacture of jewelry. Its dull, steel-gray color prevents it from being ornamental in itself, but it is plated in gold, and large quantities of it have been used in this way. If the prevailing high price is maintained, however, platinum can no longer be used in this line of manufacturing. It is thought by some that the prevailing high price will stimulate the production of the metal in Russian fields, where large deposits are believed to exist.

THERMOMETERS.

HOW FAHRENHEIT LOCATED THE FREEZING POINT.

It is about this time of year that we all begin to think of "zero." It is the part of every thermometer that is most watched and dreaded in this changeable climate of ours. The word is from the Spanish, and means empty, hence nothing. It was first used on a thermometer in 1709 by a Prussian merchant named Fahrenheit. From a boy he was a close observer of nature, and when only nineteen years old, in the remarkably cold winter of 1709, he experimented by putting snow and salt together, and noticed that it produced a degree of cold equal to the coldest day of the year. And that day was the coldest day that the oldest inhabitant could remember. Gabriel was the more struck with the coincidence of his little scientific discovery, and hastily concluded that he had found the lowest degree of temperature known in the world, either natural or artificial. He called the degree zero, and constructed a thermometer, or rude weather-glass, with a scale graduating up from zero to boiling point, which he numbered 212, and the freezing point 32, because, as he thought, mercury contracted the thirty-second of its volume on being cooled down from the temperature of freezing water to zero, and expanded one hundred and eightieth on being heated from the freezing to the boiling point. Time showed that this arrangement, instead of being truly scientific, was as arbitrary as the division of the Bible into verses and chapters; and these two points no more represented the real extremes of temperature than from "Dan to Beersheba" expressed the exact extremes of Palestine. But Fahrenheit's thermometer had been widely adopted, with its inconvenient scale, and none thought of any better until his name became an authority, for Fahrenheit finally abandoned trade and gave himself up to science. Then habit made people cling to the established scale, as habit makes the English cling to the old system of cumbrous fractional money. The three countries which use Fahrenheit are England, Holland and America. Russia and Germany use Reamur's thermometer, in which the boiling point is counted 80 degrees above the freezing point. France uses the centigrade thermometer, so called because it marks the boiling point 100 degrees from freezing point. On many accounts the centigrade system is the best, and the triumph of convenience will be attained when zero is made the freezing point, and when the boiling point is put 100 or 1,000 degrees from it, and all the sub-divisions are fixed decimally. If Fahrenheit had done this at first, or even if he had made it one of his many improvements after the public adopted his error, the luck of opportunity, which was really his, would have secured to his invention the patronage of the world.

URANIUM.—Uranium was unknown a century ago, but a lode has been found in a mine in Cornwall, England. It sells for $12,000 a ton.

EYE PROTECTION.—Blackening the nose and cheeks under the eyes has been found an effectual preventive of snow-blindness, or the injurious effect of the glare from illuminated snow upon eyes unaccustomed to it.

NEW SOCIETY.—The National Women's Health Association of America was organized in Philadelphia, July 23, with Caroline Dodson, M. D., as president, its object being to bring the laity and the medical profession into closer relations.

OXYGEN.—It appears from the Vossiche *Zeitung* that a new method of obtaining oxygen from the air has been recently invented by Dr. G. Kassner, of Breslau. It consists of pouring water upon a mixture of peroxide of barium and ferricyanide of potash, whereupon oxygen is given off in a state of great purity.

ALASKA CANDLES.—The ulikoo, or "candle-fish," of Alaskan waters, is about ten inches long, slender and full of oil. When a dried specimen is lighted at one end, it burns until the whole is consumed, giving a light equal to three or four candles. In seasons when they seek to ascend the streams, the natives rake them from the water and preserve them.

ONE MILL.—At Scranton's rail mill, Scranton, Pa., beginning with cold pig iron, 1,800 men turn out one finished steel rail every sixteen seconds. The men are aided by fuel and the most effective machinery. Each rail is 30 feet long and weighs 60 to 70 pounds per yard. The pig iron is melted, converted into steel, sent through the various rolls, is sawed into proper lengths, punched and delivered, all in one continuous operation. 350,000 tons of steel rails is the annual product of the establishment.

OPALS IN IDAHO.—The telegraph announced last week that Moscow, Idaho is greatly excited over the discovery of opal deposits four miles northwest of that town. A jeweller, while hunting, discovered stones thrown out of a newly-dug well. A moment's glance satisfied him that they were valuable. A test by the blow-pipe and acid proved the stones to be true milky and fire opal. The country is taken up all around by miners' claims. Two companies are formed and immediate prospecting will take place. The only fire opal on this continent, except these, is in Mexico.

ROTHSCHILD'S WISH.—A story is told of one of the Rothschilds which may never have been said by him, but which nevertheless is true, as every successful business man will testify. "I hope," said a friend to Rothschild, "that your children are not too fond of money and business. I am sure you would not wish that." "I am sure I should wish that," replied Rothschild. "I wish them to give mind, soul, heart and body to business—that is the way to be happy. It requires a great deal of boldness and a great deal of caution to make a great fortune, and when you have got it, it requires ten times as much wit to keep it."

FOR POSTERITY'S BENEFIT.

MR. FREDERICK HARRISON SUGGESTS AN EVERLASTING NATURAL SAFE.

Let the science and learning of the nineteenth century do for the twenty-ninth century what we would give millions sterling to buy, if the ninth century A. D. or the ninth century B. C. had been able and willing to do it for us. In other words, let us deliberately, with all the resources of modern science, and by utilizing all its wonderful instruments, prepare for future ages a sort of Pompeii or Boulak Museum, or Vatican library, wherein the language, the literature, the science, the art, the life, the manners, the appearance of our own age, and its best representatives, may be treasured up as sacred deposit for the instruction of our distant descendants. Let us no longer leave it to chance whether our knowledge and our life be preserved for them or not. Let us do all that forethought, experience, and science can do to perpetuate the best products and the noblest men of the present age. A strong room, which is to last ten centuries, must be placed far from any city, in a remote spot not liable to be wanted. If it were in the capital, or indeed anywhere near the haunts of man, some Sir Edward Watkin or J. S. Forbes of the future would be driving a railway through it, or make it, perhaps, the central balloon terminus of the universe. Like St. Paul's, the Tower of London, or Westminster Abbey, it might be wanted by the enterprising engineer, or a syndicate about to found a new electric city or a continent in the air. I propose a spot like Salisbury Plain, which it is difficult to imagine that even Sir Edward Watkin could ever persuade Parliament to give him, or that even in the twenty-ninth century could ever be included in the suburbs of London. Say Salisbury Plain, a spot beside Stonehenge; nay, it might be incorporated with Stonehenge itself, and thus link the centuries A. D. to those B. C. A building of any kind is quite out of the question, and none is wanted. All that we want is a vaulted chamber—and this must be subterranean. It would practically occupy no space at all on the surface, or none that any man could ever want. A hundred pounds might buy the site, or we might utilize a disused mine, or drive a gallery underneath Skiddaw or the Malvern Hills. Nothing is simpler than a few vaults—dug, say, underneath Stonehenge, cased twenty feet thick with the strongest known cement. A plain granite portal with a suitable inscription would be the sole architectural feature. When finished and filled, the museum would be solemnly closed up with twenty or thirty feet of cement, and a plain granite block between the granite piers would finally bar the entrance. There would be neither doors, keys, nor locks. Nothing but a gang of navvies, working for weeks under a staff of engineers, could ever open it again. It would need no guarding, no insurance, and no outlay. Fire, destruction, contractors, even an earthquake, could not touch it. So long as this island keeps its head above the German Ocean, so long the national safe would exist. The national safe might consist of a gallery with a series of subterranean vaults, like the catacombs of Rome, or the chambers under the Pyramids. Each century, having opened its own vault, might make its own deposit, seal it up, and finally close the general entrance in the same way, or as its own scientific knowledge might suggest. The tenth vault might hold a special and fuller collection, as being the more distant and liable to decay. We may assume that, as an outside casing, some form of cement, to some thickness yet to be determined, would be an almost absolute protection from fire, water, plunder, and even a restoration committee. Inscriptions cut upon lava and cased with glass might be trusted to see out the life of the planet. Let experts tell us how to protect books. A few precious poems or the like might be printed on vellum or composition and secured in hermetically sealed glass cases. Photographs on stone, similarly protected, and with all light excluded, might remain for centuries. A few choice paintings, if needful on panel, or on porcelain or ivory, might be sealed up in air-tight boxes. If experts could suggest a mode of protecting photographs from decay, or of transferring a photographic picture to some indestructible substance, it is clear that we might preserve for the twenty-ninth century photographic portraits of our great men, views of our public buildings, of our daily life, of many a historic incident. And why should not the phonograph be tried also? The Laureate would recite "The Princess," and his chosen bits from "In Memoriam" into a phonographic box, which it would be the business of Mr. Edison to protect for a thousand years. A copy of the "Encyclopædia Britannica" would give the twenty-ninth century an adequate idea of our present knowledge and opinions. If one had but a "Whitaker's Almanack" for the year 1, A. D., or for the year 1000, or 1300, or even 1600! Models of a locomotive, of an iron-clad first rate, of the Forth Bridge, of the House of Commons, might be thrown in, along with a dressed model representing Mr. Irving in "Hamlet," and a fine lady dressed for a drawing-room.

AMERICAN MECHANICS.

THE IMPORTANCE OF PROVIDING FOR THE EDUCATION OF THE YOUNG.

The good machinist is in demand, and the situation seems to indicate a majority of vacancies and a minority of men. The particular type of skilled article that is wanted is hard to find, and the difficulty increases rather than diminishes. One of the causes lies in our modern methods of industrial education. The subdivision of labor for the purposes of increased production and a cheapening process has sectionalized our skilled industries; each man has his place in the alignment, and becomes just what the manufacturer wants to make him—a specialist in a certain department. His skill is consequently limited, and his knowledge of a trade confined to the hole in which he acts as a stationary peg. The effect of this, in a general sense, degenerates the tone of industrial ambition, and the man that can command good wages with but one qualification is not likely to double the original stock. In our present system of industrial economics, the specialist may be indispensable, but the all-around and thoroughly instructed artisan will always be in demand, and the perpetuation of this rare article be an industrial policy. This can be best secured by an improvement in the system of apprenticeship and less of the shop legislation that in some cases interferes with the rights both of the employer and the apprentice. The attempt to run a young hand in the old rut of skill and product is not wise. A trade is best protected by the excellence of its work, and that mechanic is the most independent who is the best master of his business. A botch workman is an incubus on master and man, and his protection by the union to which he may belong has involved the trades in bitter strikes and much loss. Our industrial development has made such rapid strides and assumed such enormous proportions that it has necessarily incorporated many incompetent and untrained workmen, who under other circumstances would not have found their way into the higher departments of skilled industries. The consequences are apparent, and the complaint of inefficiency is general. We note some wise and weighty words on this subject in an address delivered by President Penton at the convention of the Brotherhood of Machinery Molders, held in Indianapolis, August last. He says: "It is to be hoped that this convention will see its way clear to take some action toward the establishment of a more regular and uniform apprentice system. Employers in all directions are complaining of the difficulty of obtaining competent mechanics, a trouble arising mainly through the entire lack of any system of educating or teaching apprentices. Large numbers of the so-called molders in the country have picked up a few ideas here and there, and after a brief experience, perhaps in a stove or bench shop, undertake 'to travel,' filling the places, in some instances, of more competent workmen, thus injuring the standing of the trade, and preventing its being learned by those who would develop into good workmen under proper training. An effort should be made to secure the co-operation of employers in the adoption and enforcement of some general system." This advice is sound and the counsel wise, and its industrial indorsement is the only practical escape from a threatened evil. The younger and coming type of mechanic must not be less than his predecessor in skill, or the pre-eminence of America in mechanics will be a thing of the past, and the art that commanded good wages will be so fractionalized and limited that the less of skill the less of pay, etc.—*Age of Steel.*

FRAGILE WOMAN.

ETHEREAL CREATURES CHARGEABLE WITH FORTY-FIVE TONS OF FOOD.

A cynical doctor, withal a man of wonderful resources and a quick mind, lives on one of the avenues on the south side. He was in his study a few nights ago when a young man came in and began questioning him about his (the young man's) propriety of marrying. The young man foolishly raved over his sweetheart and called her angelic and so on. He was afraid that she was too fragile for this world. The old doctor grunted. "Fragile, eh?" he asked. "How fragile? Ever test her fragility? Let me give you some figures about her, and womankind in general, showing how fragile they are. Let us suppose that this piece of perfection is in moderately good health. She will live to be, say, 60 years old. Women don't like to die any more than men do—not as much—for women never grow old, you know. Listen to me: She will eat one pound of beef, mutton or some other flesh every day. That's 365 pounds of meat in a year. In sixty years it's 21,900 pounds. How's that for fragile? She will eat as much bread and as much vegetables per diem, and there you have in sixty years 43,800 pounds of bread and meat. If she is not too angelic she will drink daily no less than two quarts of coffee, tea, wine or beer. And by the time she is ready to have a monument, she will have consumed 175 hogsheads of liquids. Fragile? Now, young man, these figures do not include the forty or fifty lambs she will worry down with mint sauce. It does not take into consideration the 2,000 spring chickens, the 500 pounds of butter, the 50,000 eggs, and the four hogsheads of sugar she will consume in sixty years. It doesn't take into consideration her ice cream, her oysters, her clams, and such. All this means about forty-five tons. Fragile? Think of your affinity in connection with these figures and then rave over her being fragile. Young man you are a fool. Boof!"—*Chicago Tribune.*

AIR NAVIGATION.

SOME CONSIDERATIONS ON ITS POSSIBILITIES AND PROBABILITIES.

In a recent number of the *Forum*, Prof. R. H. Thurston, director of the schools of mechanical engineering of Cornell University, discusses in an entertaining way the "Problem of Air Navigation." After reviewing many interesting experiments in aeronautics, Prof. Thurston thus speaks of the probability of the ultimate solution of the problem: "The researches of Langley have shown the power demanded for flight to be about two per cent. of the amount one supposed a minimum. We know that nature's energy can be directly converted into useful power through the production of electricity, as in the gymnotus, and possibly in all animal mechanisms. We know that modern storage batteries are ten times the weight that science indicates to be the limit of perfect efficiency; both steam engines

and electric accumulutors have been made light enough and powerful enough to raise their own weight, with something to spare. The flying lemur, the flying squirrel, the rude sustaining membranes that inventors have constructed, have sustained their heavy weights in drifting many yards. Man has imitated such animals. His predecessors, the bats and the great pterodactyls, have flown on membranes. Why may not he hope some time to combine the highest products of his inventive genius in some contrivance which shall enable him to drive his fusiform balloon a hundred miles an hour, defying wind and storm; or why not hope to learn from the albatross and the condor and the eagle the secrets of flight, and, like them, to soar aloft and above the clouds, to glide hour after hour on widespread, motionless wings with the speed of gales that vex the earth below, and as far as the wild goose or the carrier pigeon or the migratory eagle can fly, crossing continents and oceans, as certainly and even possibly as safely as do railway trains or steamships to-day? It would be rash as yet to assert that all this is even possible; but it would be still more rash to assert the contrary. Man has accomplished hardly less wonderful tasks. Who shall say that the limit of his powers of invention and construction has been reached or even approached? The engineer, like the man of science, has an infinity of opportunity still before him. And it is to the combination of scientific knowledge and constructive talent of the engineer rather than to the haphazard operations of the hand and brain of the ignorant contriver of olden time that we are to trust, if at all, for the accomplishment of this, the most stupendous of his tasks. Scientific research, exact computation, precise adjustment of means to well understood conditions, are the lines which lead to final success."

FASHIONABLE FADS.

SOME OF THE DECORATIONS TO BE SEEN THIS WINTER.

Sea shells are to be used largely in dinner table decoration this winter, according to a fashionable florist. At an up-down bachelor dinner given recently to several naval officers, large shells were filled with moss and wet sand, in which were inserted the stems of begonia blossoms, pink and white and coral-tinted, the small-leaved varieties only being used. These shells were placed at intervals upon a garland of ampelopsis, or Japanese ivy, surrounding a centre piece of silver cloth. In the centre of the cloth was set a statuette of Neptune supporting on his shoulders a large shell, which was utilized to hold a loster cactus in full bloom, its pinkish coral blossoms falling gracefully over the edges. This cactus is one of the smallest and most graceful varieties of the cactus family, and can be easily brought to perfection without the aid of a conservatory. It is particularly pretty for home table decoration. To return to the dinner, garlands of ampelopsis were caught on the sea god's projecting trident, and the menu cards were daintily painted marine views on sea-green watered ribbon, fastened in place at the top by tiny coral crabs. A hanging receptacle for dried golden rod or delicate autumn grasses is in the shape of a heliotrope plush bag ornamented with silver tracery and lined with palest lemon-color silk. This bag is gathered, the neck turned over in order to display the lining, and a wide-mouthed bottle is then inserted to hold the grasses or flowers. The ornament may then be suspended by a heliotrope or silver cord. Portfolios for holding engravings are effective when made of straw-colored leather. One lined with mulberry silk has a sketch of Rembrandt in monochrome on one side and on the other an appropriate motto, "Art is long." A strap and buckle of gilded leather holds the portfolio together. Book bags are exceedingly useful novelties. One made of soft brocade in tones of brown and copper, and lined with Dresden blue, becomes an attractive adjunct to a lounging chair or a library sofa. It is made thus: Take a piece of brocade 18 inches long and 13 inches wide, and line it with surah, with an inner lining of canvas or any firm material; then make four pockets or places for holding four books, of the surah, and stitch them to the inside of the bag. Drawing strings of twisted silk cord serve to suspend the bag from the arm of the chair or the sofa back. Photograph cases of silk are no longer new, but one lately seen was poetic enough to merit description. It was folded like a handkerchief case, and made of white brocaded silk. A design of pale roses and leaves delicately painted in water colors—every leaf and petal outlined with gold—covered the outside; the lining was of pale green satin, and the edges were finished in feather stitching and Japanese gold thread.—*Sun.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

October.

MEATS.—Beef, mutton, ham, kidneys, liver, venison, sausage.

GAME AND POULTRY.—Pigeon, chicken, duck, woodcock, brant, grouse, partridge, rabbit, snipe, goose.

FISH.—Bass, blackfish, bluefish, clams, cod, crabs, eels, carp, catfish, flounder, halibut, herring, lobster, mackerel, mussels, oysters, pike, porgie, prawn, rockfish, salmon, sea bass, sturgeon, smelt, turtle, white fish, whiting.

VEGETABLES.—Artichokes, beets, beans, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, corn, cucumbers, egg-plant, garlic, lettuce, onions, parsley, parsnips, potatoes, radishes, rhubarb, savoy, shallots, spinach, squash, tomatoes, turnips, water cress.

FRUITS.—Apples, bananas, blackberries, grapes, melons, oranges, peaches, pears, pineapples.

PRACTICAL RECIPES.

BEEF LOAF.—Chop fine a good slice of raw ham and two pounds of beef from which all the fat has been removed. Crumb fine three tablespoonfuls of stale bread and add it to the meat; add seasonings of salt, pepper, nutmeg, onion, allspice and chopped parsley. Bind together with a beaten egg; mix thoroughly; form into a mound on a buttered baking dish, brush with beaten egg and bake for an hour or so, basting frequently with melted butter. Eat either hot or cold.

APPLE AND CUSTARD.—One and a half pounds loaf sugar, one pint water, two pounds apples peeled, cored and cut into small pieces, one fresh lemon, one pint rich milk, three eggs, vanilla and nutmeg. Boil the sugar in the water till it is a thick syrup, add the apples and grated peel and juice of the lemon and cook to a pulp; turn into a mold and let it stay until the following day. Make a rich custard with the eggs and milk, sweeten and flavor and serve very cold with the apples.

PEACH JELLY.—Peel your peaches, take out the stones and put them to boil with a very little water, crack a handful of the stones and take out the kernels and put them with the fruit. When the peaches are soft strain and measure them and return them to the kettle with sugar, allowing a pound to every pint of juice. Stir while cooking until the sugar dissolves, then pour into glasses and set away.

CURRIED LOBSTER.—Extract the meat from a good-sized lobster and cut it into small pieces. Slice a small onion and fry it brown, mix some curry quite smooth, moistened with gravy, add the onion to it and put it with the lobster and a little broth over the fire. Cover and stew for half an hour or so. Garnish with sliced lemon and serve.

CAULIFLOWER SALAD.—Boil a cauliflower, and then let it get quite cold; shred it into a bowl; make a mayonnaise dressing and serve with it.

STUFFED POTATOES.—Select fine large potatoes, bake them, scoop out the insides carefully so as not to break the shells. Mince some cold meat, season it highly; add a little of the potato, moisten slightly with gravy or melted butter; fill up the potato shells, brush with beaten egg and bake for a few minutes.

GREEN TOMATO PIE.—Line a deep earthen pie dish with paste, slice some green tomatoes very thin and put a layer of them in the dish; over them pour some molasses well seasoned with ginger, then add more tomatoes, then more molasses and so on until the dish is full. Put on the top crust and press the edges carefully down to the lower one. Prick the crust with a floured fork and bake.

OILSTONES.

WHAT THEY ARE AND WHERE THEY COME FROM.

Washita oilstone rock is crystallized silica. The crystals are very small and are formed in clusters with the point ends interlaced, leaving numerous cavities. These minute crystals are hexagonal in shape with sharp points and can be seen under a microscope when magnified about 100 times. They are harder than steel, and that is why whetstones cut from this rock will wear away and sharpen steel tools. Washita whetstones are called oilstones because oil must be used to fill the cavities; and float away the steel particles that are cut off the tools. The peculiar geological formation from which these rocks are taken is not known to exist outside the State of Arkansas, where it occurs in many of the mountains of Saline, Hot Spring, Garland, and Montgomery counties. These strata are in a vertical position varying from nearly perpendicular to nearly horizontal, and have been considerably broken by upheaval or folding of the earth's crust. There are many grades in the quality of this rock, from very hard and vitreous flint to the softest whetstone grit. Nearly all of it is very hard and vitreous or contains some impurity. One grade, of a dull white color full of cracks and having but little grit, called bastard stone, is plentiful throughout this formation, but is not used for whetstones. Some of the Washita rock quarried is not uniform in its texture, but contains hard spots and soft streaks that make uneven grit in the whetstones. Sound blocks, composed of perfect crystals, unform in hardness, and having sharp grit, are only found in a few quarters in Garland County, near the city of Hot Springs. The different grades of Washita rock that are used for whetstones weigh from 125 to 165 pounds per cubit foot. The best grades for good oilstones weigh from 135 to 145 pounds per cubit foot. The hardness and weight and the sharpness of the grit in any Washita oilstone depend entirely upon the character of its crystallization; and no fine polish or nice finish on the surface, no fancy name, will change the grit. Nature made and arranged these crystals mysteriously and man cannot change them. The oilstone manufacturer only cuts the rocks into whetstone shapes and sizes; nothing more. He cannot make the grit in whetstones better than it is in the rock, and he cannot make good oilstones of Washita rock that is impure or vitreous, or of unequal hardness. The softest Washita rock contains many grains of sand among the crystals. This quality has sharp grit but slight cohesion, so that the crystals separate readily and the stones wear away too fast. Such whetstones contain many sand holes. The lightest-weight rock that has perfect and uniform crystallizations without any grains of sand is the best quality to sharpen all wood-workers' tools, and it makes the most durable oilstones. The light-weight whetstones generally have the sharpest grit, because they are the

most porous. In them the crystals are interlaced in such a manner as to leave many cavities, and each cavity presents a great number of crystal points. The hard and heavy rocks are not sufficiently porous, being too compact. In them many of the crystals interpenetrate each other in a manner that leaves less cavities and fewer crystal points.

SILLY NAMES.

SOME OF THE TOWNS ENUMERATED IN THE NEW POST-OFFICE GUIDE.

The ever-observant Ben Abou says: "I received a letter recently postmarked 'Negro Foot, Va.' The name seemed so odd for a government post-office that I consulted an official postal guide to see if 'Uncle Sam' endorsed it. A glance through the guide discovered hundreds of others as little creditable to his taste and dignity. For instance, 'Big Foot' is an office in Indiana, 'Pig' in Kentucky, 'Skull Bone' and 'Mouse Tail' in Tennessee, 'Buzzard's Roost' in Georgia, and 'Corn Cob' in South Carolina. 'Number One' is a Maine post-office, and Vermont has a 'Bread Loaf.' In New York State we have a 'Promised Land,' a 'Painted Post,' 'Good Ground,' and 'Half Moon.' Pennsylvania might have selected better sounding names than 'Bird in Hand,' 'Bean,' 'Bald Eagle,' 'Burning Bush,' 'Darling,' 'Good Interest' and 'Gum Tree.' 'Gunpowder' is in Maryland. while 'Old Hundred' and 'Alone,' with 'Negro Foot,' are in Virginia. West Virginia boasts a 'Left Hand' and North Carolina the grace of 'Charity,' blessing of 'Prosperity' and 'Forks of Pigeon.' Georgia is discredited by a 'Dirt Town,' and has 'Alligator,' 'Fish' and 'Cold Water.' 'Pay Up' and 'Cut off' are also Georgia offices, 'Big Coon,' 'Coal Fire' and 'Red Rose' are in Alabama and 'Bananas' in Florida. Texas has an inhospitable 'Adieu,' the first on her list. But then she shows to us a 'Baby Head' and offers us 'Benzine,' and tells of her 'Cotton Gin' and of her famous 'Cow Boy,' by which time we are no 'Stranger.' Arkansas claims 'Good Luck' and a 'Sweet Home,' and Missouri a 'Chain of Rocks' and 'Medicine.' Tennessee knows her 'A, B, C's, but talks slang, 'U Bet,' though a 'Baptist' is there and a 'Calf Killer.' 'Leap Year' and 'Safe Lock' also belong to Tennessee. Kentucky has 'Back Bone,' 'Hard Money,' an 'Apple Tree' and 'Paw Paw.' Indiana sets up pretensions to 'Art,' and straightway selects such names as Mud Lick, Potato Creek, Pinka Mink, No Go, Soon Over, Don Juan and Toll Gate for Hoosier Post-offices. And this is the State whence comes the august dignitary of the White House. In Ohio there is Antiquity; Michigan has a Waltz, None Such, and Cob Moo Sa. Highland Mary has emigrated from Scotland to Colorado, where she has become Troublesome, possibly from having to drink from a Tin Cup. Kansas has a Cheese Man, a May Day and Pop Corn. What a silly lot of names these for Government post-offices! It is the custom for the Post-Office Department to sanction the name nominated by the citizens petitioning for the establishment of a post-office. It is, of course, the privilege of the people of any community to thus advertise themselves as donkeys, but for the dignity of the Government should not the Department exercise a veto of such boorish nominations?"

BUSINESS NOTES.

A MILLION LAMPS.

What's a million? Scarcely conceivable at times, and yet often accepted with composure. For instance, a million suns, a million worlds, a million Egyptian pyramids, even, are hardly conceivable; but a million dollars lost in Wall Street is another affair. Tell a Jerseyman of a million mosquitoes, and he won't tell you he is "somewhat of a liar himself;" on the contrary, he will put you down as altogether too good and moderate for that climate. There are sixty million people, and possibly ten million families in our country. Of the thousands of different kinds of lamps sold in the last 150 years, not every family even has one, for many use gas, and some still use candles. A lamp is something that stays by; it does not decay, and there are hundreds in the country fifty years old or more. And yet in the short period of five years every fifth family has bought a "Rochester" lamp; for the manufacturers report that over two million have been sold within that time.

Felon Cure.—To cure a felon, says a correspondent, mix equal parts of strong ammonia and water, and hold your finger in it for fifteen minutes. After that withdraw it and tie a piece of cloth completely saturated with the mixture around it and keep it there till dry. If this treatment is adopted when the ailment is at first realized, the pains will cease at once.

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CONTENTS.

THE CIGAR OF THE FUTURE.

According to the well-informed editor of *Tobacco* there is in only one respect any unanimity of opinion as to the probable effect of the new tariff on the price of cigars, and that is that the three-for-a-quarter clear Havana will be retailed for ten cents straight; and the greater portion of the imported cigars now sold for ten cents or under must go. The average raise on the former will be about $12 per 1,000, and on imported cigars from $20 to $30, according to the weight. No material reduction of size can be made that will offset this advance and thereby equalize prices, for in many instances the cigars are now made too loose and "spongy." In the meantime it is gratifying to record that cigarette smoking is said to be very much on the decrease in New York and it would be very interesting if the exact statistics about the sale of the noxious little weed, which has been such a source of interminable annoyance to man for years past, could be obtained. Unfortunately, however, there is so much of the show business in the cigarette trade that exact facts are as difficult to attain concerning the sale of the rival firms as are the actual receipts at theatrical box offices. It is a significant thing, however, that during the past year the cigarette firms have been steadily reducing their prices, until now the small boy and the iniquitous dude can render his neighborhood intolerable by the expenditure of six cents instead of ten to fifteen cents.

A CYCLONE OF FICTION.

"Reading," said Lord Bacon, "maketh a full man, conference a ready man, and writing an exact man;" adding a little further on that if a man "reads little, he had need have much cunning to seem to know that he doth not." Evidently in those days men read to learn, and to store their minds with useful knowledge. Even Montaigne, while pretending that his reading was designed more for pastime than for acquisition, confesses that "if I study I only endeavor to find out the knowledge of myself, which may instruct me how to die well and how to live well"—the philosopher revealing himself in spite of his attempt at modest disclaimer. The need of study and the necessity of making one's self familiar with the contents of books, if one would hold a respectable position in polite society, are more apparent now than they were in the days of Montaigne and Bacon, when human science was confined to fewer and far narrower lines of discussion. Accordingly, to the reading, as to the making, of books there is no end. But there is a sort of reading that tends more to harm than to benefit. It is a habit rather than an expression of intellectual taste, the gratifying of a craving not unlike that grosser one which leads to indulgence in physical stimulants, a propensity whose fatal tendency is to enervate and destroy instead of strengthening the mind. Happily it is of too recent origin to have produced any marked results as yet, though if the tendency be not arrested serious consequences may be apprehended. The tendency we refer to is the habit of promiscuously devouring the works of fiction that are being poured forth in unceasing stream by an army of publishers in this country and in England. We do not go so far in denunciation of the evil as some whom we have heard declare it to be a vice, in all respects as pernicious as drinking, gambling and opium eating. There is an implication of degradation and moral obliquity in those habits which in no manner attaches to the victims of the book-reading mania. In the case of these latter, the worst that can be said of them is that they are assiduously wasting their time and earnestly undermining whatever intellectual powers they may have been endowed with by nature. The mass of literary stuff, a little of which is good, the most of it inferior, and some of it absolutely vile and detestable, that floods the community uninterruptedly, is of almost inconceivable magnitude. That it all finds readers, as it certainly must, is truly remarkable. For it is notorious that not one in many thousands of the printed pages daily perused by thousands of people has any relation to sound knowledge or culture. Neither are they read with any intent to improve the reader's mind. People read newspapers and books as a matter of pure habit, partly to get a glimpse of the current scandals of the hour, partly to kill time, and mostly to avoid the trouble of thinking. The inevitable result is the growth of a superficial semi-enlightenment in the community not far removed from sheer ignorance. The evil, however, seems to have attained to its present portentous dimensions within the past decade, and, like other social aberrations that periodically manifest themselves, it is likely to subside again as rapidly as it has grown into significance. Life presents too many serious problems demanding our closest attention to permit its being frittered away in vacuous self-indulgence.

BEER AND GLASS.

Dr. Schultze, in *Science*, claims to have established, by a very extended series of experiments, that beer, by as little as five minutes' standing in any glass, even when cold and in the dark, will be materially affected both in taste and odor. By making trial tests on some hundred persons he sustains his claims. The change is due, as he thinks, to the slight solubility of the glass substance in the beer. Lead is used in the manufacture of glass, making it more easy to manipulate, and from experiments with glass obtained from the leading source of supply he determined that one cubic centimetre of beer, by five minutes' standing in glass, dissolved 6-26 ten millionths of a milligram of the glass substance containing 0-48 thousand-millionths of a milligram of lead oxide. It is this small quantity of glass substance that affects the taste of the beer, and if it contains lead, renders it objectionable for sanitary reasons. By further experiments with vessels of different substances, he comes to the conclusion that gold-lined silver mugs are the best, and he ranks covered salt-glazed stone mugs as good.

CENSUS ROMANCES.

According to the newspaper correspondents in Washington the taking of the census in some parts of the country was attended with extraordinary difficulties. Geographical hindrances rendered it most hard in Eastern Oregon, Southern Utah, Southern Nevada and Florida. In Eastern Oregon there is such lack of mail facilities that many enumerators were more than two hundred miles from any railway, so that the schedules had to be transported by stage and horseback. The population of Southern Utah and Southern Nevada is exceedingly sparse, so as to make enumeration correspondingly expensive and difficult. Florida is mostly swamp, its people over by far the greater part of its

territory widely scattered, and transportation being almost out of the question. Perhaps the most dramatic incident of the census occurred in the great Nevada desert. One enumerator was only able to get his blank schedules from the supervisor by having them conveyed to him across the desert, a distance of one hundred and ten miles, by an Indian. The copper-colored messenger took with him only a flask of water. He did not arrive when he was expected and the enumerator, alarmed at the delay set out to look for him. Starting across the dreadful waste from the opposite side, he found, after a day's journey along the trail the corpse of the Indian half buried in the sand. The unfortunate messenger had died of thirst.

PSEUDO JOURNALISM.

The discovery that swarms of beneficient bacteria called phagecytes inhabit the blood vessels and destroy the invading bacteria of disease, except when the latter appear in overwhelming numbers, bids fair to revolutionize the practice of medicine. Already an eminent physician has declared that in the future the aim of the medical man will be to strengthen the muscles, constitution and appetite of the phagecytes, so that they will be able to kill and eat a greater number of bacteria than now satisfies their wants; and he maintains that by kind and judicious treatment the efficiency of the phagecytes can be greatly increased. But has he not forgotten the lesson so often taught by the domestic cat? It is her business to kill and eat the mice that infest her master's house, but if she is treated with injudicious kindness and fed with good food she disdains to sully her paws with mice and spends her time sleeping on the hearth rug. If our phagecytes are treated too well may they not prove as unprincipled as cats and allow our system to be overrun with all sorts of bacteria.

The above feebleness is an extract from one of the latest issues of the *London Herald*, a curiosity of an alleged newspaper character that enjoyed an ephemeral existence of a few months in the British metropolis. After reading the paragraph quoted, it may readily be imagined that we were not surprised to hear of the paper's speedy collapse, which propitious event happened about a month ago. No journal could long survive the introduction in a scientific capacity of Mr. Radam into its editorial staff. It is understood, however, that the proprietor's jealousy of that gentleman's superior ignorance of the bacillus theory was the immediate occasion of the paper's discontinuance.

Tea in England.—Ten years ago China had almost a monopoly of the English tea market, but now India and Ceylon furnish 59 per cent. of the quantity consumed. The India and Ceylon teas are said to be stronger than the Chinese. Coffee is rapidly being superseded by tea as a beverage in England.

SOCIETY ANALYZED.

THE LEADER OF THE "FOUR HUNDRED" DESCRIBES HIS CONSTITUENCY.

The advance sheets of Mr. Ward McAllister's long-expected book, "Society as I Have Found It," have been issued to the daily press through the country, and doubtless by the time this writing gets into type the book itself will have been published. The work is more than a publication of recollections, for it is really a hand-book of the manners and customs of fashionable society. It was at a ball given in Florence by the Grand Duke of Tuscany that Mr. McAllister first learned what a ball supper should be. He says: "And what were the proper mural decorations for a ball-room and the halls opening into it? The supper system was perfect. In one salon, large tables for coffee, tea, chocolate and cakes. In another, tables covered simply with ices and other light refreshments, *foie gras*, sandwiches, etc. In the grand supper room, the whole of the wall of one side of the room, from floor almost to ceiling, was covered with shelves, on which every imaginable dish was placed, hot and cold. The table in front of these shelves was lined with servants in livery, and simply loaded with empty plates and napkins to serve the supper on. The favorite and most prized dishes at all these suppers was cold sturgeon (a fish Americans never eat), and the most prized fruit the hot-house pineapple, with all its leaves, and to the eye seemingly growing. Opposite the supper table, in another part of the room, the wines were served, all by themselves, and there was, it appeared to me, every wine grown in any quarter of the globe. Everything was abundant and lavish, and the whole affair was most imposing. I remember at one of these balls dancing with an American girl, a strikingly handsome woman, a Great Stonington belle. As we waltzed by the King of Bavaria I felt a hand placed on my shoulder, and a voice exclaimed: '*Mais, Monsieur, c'est le roi.*' I stopped at once, and hastily inquired of my fair partner, 'What is it?' She replied, 'I did it; I was determined to do it. As I passed the King I punched him in the side with my elbow. Now I am satisfied." I rushed up to the King and Grand Chamberlain, saying, "Mille pardons, mille pardons,' and the affair passed over, but I soon disposed of the young woman and never 'attempted her again.' The diamonds the women wore amazed me. You see nothing in this country like the tiaras of diamonds I saw at this ball; tiara after tiara, the whole head blazing with diamonds, and yet there was but little beauty."

Perhaps the keynote of Ward McAllister's social success, the ambition of his life as it appears to have been, was struck by John Jacob Astor when he said, at the close of his first dinner with Mr. McAllister: "My young friend, if you go on giving such dinners as these you need have no fear of planting yourself in this city." But the way to fame is sometimes long and tedious, and the book had better be left to tell that story. Here is Newport as Ward paints it: "Those were the days that made Newport what it was then and is now, the most enjoyable and luxurious little island in America. The farmers of the island even seemed to catch the infection, and they were as much interested in the success of our picnics and country dinners as we were ourselves. They threw open their houses to us and never heeded the invasion, on a bright, sunshiny day, of a party of fifty people, taking possession of their dining room, in fact, of their own house, and frolicking in it to their hearts' content. To be sure, I had often to pacify a farmer when a liveried groom robbed his hen roost, but as he knew that the fashionable horde always paid their way, he was easily soothed. I then remarked that in Newport, at that time, you could have driven a four-in-hand of camels or giraffes, and the residents of the island would have smiled and found it quite the thing. The charm of the place then was the simple way of entertaining; there were no large balls; all the dancing and dining was done by daylight, and in the country. I did not hesitate to ask the very *creme de la creme* of New York society to lunch and dine at my farm, or to a fishing party on the rocks. My little farm dinners gained such a reputation that my friends would say to me, 'Now, remember, leave me out of your ceremonious dinners as you choose, but always include me in those given at your farm, or I'll never forgive you.' But to convey any idea of country parties, one must in detail give the method of getting them up. Riding on the avenue on a lovely summer's day, I would be stopped by a beautiful woman, in gorgeous array, looking so fascinating that if she were to ask you to attempt the impossible you would at least make an effort. She would open on me as follows: 'My dear friend, we are all dying for a picnic. Can't you get one up for us?" 'Why, my dear lady,' I would answer, 'you have dinners every day, and charming dinners, too; what more do you want?' Oh, they're not picnics. Any one can give dinners,' she would reply;' 'what we want is one of your picnics. Now, my dear friend, do get one up.' This was enough to fire me and set me going. So I reply: 'I will do your bidding. Fix on the day at once, and tell what is the best dish your cook makes.' Out comes my memorandum book, and I write: 'Monday, 1 P. M., meet at Narragansett Avenue; bring *filet de boeuf pique*,' and with a bow am off in my little wagon, and dash on, to waylay the next cottager, stop every carriage known to contain friends, and ask them, one and all, to join our country party, and assign to each of them the providing of a certain dish and a bottle of champagne. Meeting young men, I charge them to take a bottle of champagne and a pound of grapes, or order from the confectioner's a quart of ice cream to be sent to me. My pony is put on his mettle; I keep going the entire day getting recruits; I engage my music and servants and a carpenter to put down a dancing platform, and the florist to adorn it, and that evening I go over in detail the whole affair, map it out as a general would a battle, omitting nothing, not even a salt spoon; see to it that I have men on the road to direct my party to the farm, and bid the farmer put himself and family and the whole farm in holiday attire."

Mr. McAllister tells the following good story of one of the best-known men in New York society, since dead, whom he designates as the "Major," but who really bore a higher rank: "As my farm parties were always gotten up at a day's notice, I was often in straits to provide the dishes for all that was wanting to complete the feast I furnished myself. A boned turkey on one occasion was absolutely necessary. The day was a holiday. I must at once place it in the cook's hands. The shops were all shut, so I suggested to the Major that he drive out with me to my farm and procure one. When we reached the place, farmer and family, we found, had gone off visiting; there was no one there. I took in the situation at a glance. 'Major,' I said, 'there, in that field, is a gobbler; that turkey you and I have got to catch if it takes us all night to get him.' Positively I shall not leave the place without him. He looked aghast. There he was in Poole's clothes, the best dressed man in America! This he always was. On this point, a friend once got this off on him: As he was entering his club with another well-dressed man of leisure, this gentleman exclaimed: 'Behold them! like the lilies of the field, they toil not, neither do they spin, yet Solomon in all his glory was not arrayed like one of these.' Clothes or no clothes, in pursuit of the turkey we went. Over fences, under fences, in barnyards and through fields, at a full run, the perspiration pouring down the cheeks of the dear old Major, and I screaming encouragement to him. 'Try it again, Major! Head him off! Now you have him!' Finally, after an hour's chase, we got the bird, when, throwing off his coat, straightening himself and throwing his arms akimbo, he exclaimed: 'Well, Mc., the profession of a gentleman has fallen very low when it takes to chasing turkeys.' 'My dear fellow,' I replied, 'the great Chancellor Livingston once said, 'A gentleman can do anything; he can clean his own boots, but he should do it well.'"

Mr. McAllister's account of his experiences with socially ambitious mothers when he was manager of the Family Circle Dancing Class is amusing. Only by practice of the most astute diplomacy did he manage to keep from making life-long enemies. "The launching of a beautiful young girl into society," says Mr. McAllister, "is one thing; it is another to place her family on a good, sound, social footing. You can launch them into the social sea, but can they float? 'Manners maketh the man,' is an old proverb. These they certainly must possess. There is no society in the world as generous as New York society is; 'friend, parent, neighbor, all it will embrace,' but once embraced they must have the power of sustaining themselves. The best quality for them to possess is modesty in asserting their claims; letting people seek them rather than attempting to rush too quickly to the front. The Prince of Wales, on a charming American young woman expressing her surprise at the cordial reception given her by London society, replied: 'My dear lady, there are certain people who are bound to come to the front and stay there. You are one of them.' It requires not only money but brains, and, above all, infinite tact; possessing the three, your success is assured. If taken by the hand by a person in society, you are at once led into the charmed circle, and then your own correct perceptions of what should or should not be done must do the rest. As a philosophical friend once said to me, 'A gentleman can always walk, but he cannot afford to have a shabby equipage.'"

Mr. McAllister speaks of the importance of a pleasant manner to a woman who desires to make a social success. Then he argues: "If women should cultivate pleasant manners should not men do the same? Are not manners as important to men as to women? The word 'gentleman' may have its derivation from gentle descent, but my understanding of a gentleman has always been that he is a person free from arrogance and anything like self-assertion; considerate of the feelings of others; so satisfied and secure in his own position that he is always unpretentious, feeling he could not do an ungentlemanly act; as courteous and kind in manner to his inferiors as to his equals. The best bred men I have ever met have always been the least pretentious. Natural and simple in manner, modest in apparel, never wearing anything too voyant or conspicuous; but always so well dressed that you could never discover what made them so—the good quiet taste of the whole producing the result." On the subject of dinners, Mr. McAllister says: "In planning a dinner the question is not to whom you owe dinners but who is most desirable. The success of the dinner depends as much upon the company as the cook. Discordant elements—people invited alphabetically or to pay off debts—are fatal. Of course, I speak of ladies' dinners. And here great tact must be used in bringing together young womanhood and the dowagers. A dinner wholly made up of young people is generally stupid. You require the experienced woman of the world, who has at her fingers' ends the history of the past, present and future. Critical, scandalous, with keen and ready wit, appreciating the dinner and wine at their worth. Ladies in beautiful toilets are necessary to the elegance of a dinner, as a most exquisitely arranged table is only a solemn affair surrounded by black coats. I make it a rule never to attend such dismal feasts, listening to prepared witticisms and 'twice told tales.' So much for your guests." There's a world of information in the book, including full descriptions of the most famous entertainments ever given in New York, which are made valuable and interesting, as they are from the inside. Among these are the famous $10,000 dinner, given by an extravagant foreigner, at which live swans from Prospect Park were part of the table decorations, the "gold," "silver" and "diamond" dinners given by equally extravagant New Yorkers, the Vanderbilt costume ball, the Bradley-Martin ball of last winter, and his own "New Year" ball, which closed last season.

CORN FOR EUROPE.

THE TARDY RECOGNITION BY EUROPEANS OF THE FOOD VALUE OF INDIAN CORN.

On this subject, to which the AMERICAN ANALYST has referred repeatedly, in the earnest hope of aiding in the accomplishment of a result that would be a world-wide benefit, the *Commercial Bulletin* of October 25th says:

The United States consume in food for the people and for animals nearly all—more than 96 per cent.—of their enormous crop of corn. Staple of life in the West and South as this food is, it has gained but a slight hold on the rest of the civilized world. Of the 69,000,000 bushels exported last year out of a crop of 2,000,000,000 bushels, the takings of other countries were as follows:

United Kingdom	41,000,000
France	6,565,000
Germany	4,608,000
Canada	8,000,000
Belgium	4,000,000
Denmark	1,855,000

This leaves only about 5,000,000 bushels for the other lands to which our corn was exported, and which do not exactly pine for it. The magnitude of the corn crop in this country excites the wonder of the people in countries where corn is not raised, or raised only to a limited extent, or experimentally. Corn, or maize, is emphatically an American product, and some writers estimate that it is consumed by more people than any other grain except rice. For the ten years, 1870–79, our corn crop averaged 1,184,487,000 bushels; for the next ten years, 1,703,443,000. The average export for thirty years was 53,395,383 bushels. The years of highest export were 1876 and the next four, for which the average was 88,000,000 bushels; one year, 1879, showing an export of nearly one hundred millions. In the year ending June 30, 1879, the United Kingdom took 64,000,000 bushels, and the next year 56,000,000. The export of last year was 69,000,000 bushels; of the year before, 25,000,000. This variation is very marked, rising to 57 per cent. of the entire crop and falling to 1. The mere dimensions of the crop do not necessarily affect exportation. In 1881, when the valuation per bushel at the farm was as high as 63.6 cents, the export was three million bushels more than in 1882, when the value was 48.4 cents, while the crop was 400,000,000 bushels greater than in 1881. In 1870, when the percentage of export to production was 1, the price at the seaboard was 92½ cents, and in 1880, when the ratio of export to production was 5½ per cent., the price at the seaboard was 54.3 cents. In 1870, the high price at home prevented exportation; in 1880, the low price increased the foreign demand. Large as the crop is, there are only a few States that raise corn for export. Most of this corn comes from beyond the Mississippi, where the price is lowest. Thus, when in 1888 corn was 29 cents in Illinois and 31 cents in Indiana, it brought 26 cents in Kansas and 22 cents in Nebraska, the export value being 47.4 cents. A great effort was made last year to popularize Indian corn in Europe by touching and toothsome appeals to the millions who swarmed at the Paris Exhibition. France raises about 13,000,000 bushels of inferior corn, mostly fed to farm animals or made into spirits. So first-class American corn was taken to Paris and the work began. Commercial Agent Griffin, at Limoges, writes hopefully of the attempt to introduce corn as human food, and suggests the following up of agricultural fairs, and dealing out many kinds of corn food to the assembled peasants, showing them how to prepare it, and inducing them to eat it and be overcome by its cheapness, its appetizing qualities and its nutritiousness. The experimenter at Paris was Mr. Charles J. Murphy of Nebraska, a State Commissioner to the Edinburgh Exhibition of this year. He was less successful in Paris than in Edinburgh. In both cities he appeared not as a corn grower or corn dealer, but unsubsidized, and having no pecuniary interest in the grain. He was a peripatetic philanthropist, feeling, as he says, that "he could be of no greater service to the toiling millions of the world than by instructing them as to the best means of procuring the cheapest and most nutritious food." He cooked corn in its scores of different forms—from plain mush to the more classic gems and "pones." He had dishes for breakfast, luncheon, dinner and supper, for steady diet and for dessert, on the cob or on the "pop." It was a revelation and a wonder, and the canny Scots ate thankfully, and doubtless returned gladly to their accustomed oats. But the scheme was a good one, and the plan of procedure was truly an American idea; albeit in all ages the Fair and the Kirmess have been occasions for the introduction and sale of wares. Mr. Murphy, in furtherance of his plan, has prepared a pamphlet, in which he gives his lecture before the International Congress of Millers at Paris, and also over one hundred formulas for the preparation and cooking of corn, besides much other matter of moment. Doubtless it will be slow work to get a foothold in Europe for corn, and it is very certain if it does gain one, that American corn will soon find a rival in the East Indian production of the same cereal.

LIQUID SOAP.

THE ADVANTAGES CLAIMED FOR MEDICATED LIQUID SOAPS.

In a paper read before the recent congress of Russian Pharmaceutical Societies, Herr Saidemann called attention to the therapeutic value of liquid soaps, which he claimed to present the advantages of being more suitable for inunction, favoring admixture of medicinal substances, and being always producible from vegetable oils, thus avoiding the use of animal fats (*Phar. Zeit Russl.*, Dec. 24, p. 820). The formula recommended by him for a liquid soap is to mix 1 part of caustic potash dissolved in an equal weight of water with 4 parts of olive oil and one-fourth part of alcohol, and shake it vigorously during ten minutes. The mixture is repeatedly stirred during the next hour, then mixed with an equal quantity of water, and after standing several days filtered. The author states that carbolic acid incorporated with potash soap has its caustic and poisonous properties paralyzed, while its disinfectant action appears to be increased. It is also stated that the Berlin District Sanitary Commission has found a solution of potash soap in 10,000 of water completely to prevent the development of the splenic fever bacillus, and has recommended a solution of 14 parts in 10,000 as one of the best disinfectants.

EXCRUCIATING.—An Austrian has invented an instrument resembling a piano in appearance which contains six violins, two violas and two violoncellos and is manipulated by a keyboard.

INSECT HEAT.—The heat produced from the light of a firefly is only one per cent. of an equal amount of candle-light. The bug's light is produced by a chemical action, as it is increased by putting the fly in oxygen, and diminished in an atmosphere of nitrogen.

AN ENDURING GUN.—In some of the endurance tests of the Maxim gun in Germany, 34,000 rounds were fired from a single barrel—20,000 rounds of cartridges with steel-covered bullets being fired from a single barrel before the rifling was materially injured.

WOMEN WORKERS.—According to reports which have recently been published, Germany employs 5,500,000 of women in industrial pursuits; England, 4,000,000; France, 3,750,000; Italy, 3,500,000, and Austro-Hungary nearly the same number.

FRENCH FEASTING.—A dinner and a reception at the house of President Carnot are, according to a Paris caterers' periodical, pretty expensive affairs. The last time the President entertained the bill was as follows: Dinner of 400 covers at $7 per cover, $2,800; buffet for 3,000 persons at the reception, $5,054; music, flowers, &c., $15,000; 1,500 quarts of champagne, costing $2 per quart, were drunk, as well as 500 bottles of Bordeaux at $1.50 per bottle, and 200 bottles of beer at 12 cents per bottle.

A 40-INCH LENS.

WHAT THE LARGEST TELESCOPE IN THE WORLD MAY REVEAL.

The news of the recent arrival from Paris of one of the lenses for the object-glass of the 40-inch telescope that is to be made by the Clarks, of Cambridgeport, for the University of Southern California, has attracted considerable attention. It does not appear to be generally understood that the work of constructing the huge object-glass that is to eclipse the Lick telescope has but just begun, and that the most difficult and delicate part of it has not yet been touched. Not one lens only, but a second, must be finished before the object-glass is ready. That portion of a telescope consists of two lenses, one of flint and the other of crown glass, which by their different refractive properties correct one another's chromatic errors and produce an image free from confusing fringes of colored light. For two or three years the makers will slowly shape and polish the lenses, until every ray of light that passes through them is brought, as near as human skill can compass it, to one exactly accordant focus. When the glass is finished, only some of the rarest of the world's great gems will rival it in money value. But the most interesting questions connected with the making of this huge telescope are: What will it be able to do? how much will its powers exceed those of the greatest telescopes now in existence? and what discoveries in the heavens may be expected from it? The most powerful telescope now on our planet is that of the Lick Observatory, whose object-glass is 36 inches in diameter. The celebrated telescope of Lord Rosse, in Ireland, is much larger, it is true, being no less than six feet, or 72 inches in diameter, but that is an instrument of a totally different kind, being a reflecting and not a refracting telescope. In a reflecting telescope there is no object-glass, but the image of the object looked at is formed by a concave mirror, which brings the rays of light to a focus by reflection. Lord Rosse's telescope, owing to the vast size of its mirror, receives far more light from a star than the Lick glass does, but the lack of complete reflection from the mirror, and the imperfections in the mirror's form, more than counterbalance this advantage, so that for most of the purposes of astronomy California's Lick refractor is a far more effective instrument than its giant reflecting rival in Ireland. So it is with the Lick telescope that the new 40-inch glass should be compared. It is easy to compare the light-gathering powers of the two object-glasses, since these vary directly as the squares of the diameters of the glasses. The square of 36 is 1,296, and the square of 40 is 1,600. It appears, then, that while the diameter of the new glass will be only one-ninth greater than that of the Lick glass, its light-grasping power will be about one-fourth greater. This will be a very important gain, if the workmanship upon the new glass is equal to that displayed by the old one, for celestial phenomena, such as faint stars and nebulæ, that lie beyond the reach of the great telescope on Mount Hamilton, will be readily seen with the aid of its larger rival in Southern California. Among the discoveries which Dr. Holden has achieved with the Lick telescope is that of the existence of heliacal nebulæ—that is to say, of nebulous masses which, by some wonderful process, have been drawn out into vast spiral coils like the thread of a screw. These are not insignificant, but so extensive that if our own huge solid globe were expanded into a cloud of thinnest vapor, it would be but a speck beside them. The new 40-inch telescope ought to throw a flood of light upon these strange forms. Then in astronomical photography, which has made astonishing strides within a few years past, the new telescope may fairly be expected to perform wonders. Its great object-glass will grasp forty thousand times as much light as can enter the pupil of an average human eye—and this light, concentrated upon the extremely sensitive plates which the modern art of photography furnishes, will picture there scenes in the depths of space which no eye has ever beheld or could ever hope to behold in any other way. A marvellous field for research of this description has, within a few months, been discovered in the constellation of Orion, where many square degrees of the sky surrounding the Belt of Orion have been found to be covered with a net-work of nebulous streaks and patches, amid which shine thousands of stars. How this wonderful region will appear in the new telescope when it has been mounted on its mountain top in the transparent air of Southern California can, as yet, only be imagined. A popular way of estimating the power of a telescope is by stating how near it will bring the moon. We observe that somebody says the 40 inch glass will make the moon appear only 100 miles away. This, when made without qualification and explanation, is a misleading statement. The apparent distance of the moon, or any other object, depends upon the magnifying power employed. An ordinary opera-glass magnifies three diameters, and apparently brings all objects seen through it three times as near as they actually are to the observer. There are not a few telescopes now in existence that are capable of bringing the moon within an apparent distance of only 100 miles. For that purpose it is only necessary to use a magnifying power of 2,400 diameters, the actual distance of the moon being in round numbers 240,000 miles. This effect does not depend upon the size of the object-glass, although the clearness of the view does. For telescopes of the best quality a magnifying power of 100 diameters for each inch of the diameter of the object-glass may be used upon the moon with fairly good effect when the atmosphere is at its very best. By pressing the magnifying power beyond that degree more is lost by the increasing indistinctness and imperfection of the image than is gained by its greater size. Accordingly, 100 diameters to the inch may be regarded as the upper limit of magnifying power for a telescope. A 4-inch glass should bear a magnifying power of 400 for bright objects when the atmospheric conditions are suitable; but usually so high a power is found impracticable, owing to the unsteadiness of the air and other causes, and a power of 60 to the inch is, perhaps, about the estimate of the best average capacity of an ordinary object-glass. With a very large object-glass even this power is generally too great to produce a satisfactory image, so that about 50 to the inch may be regarded as the ordinary limit for a glass 40 inches in diameter. That would mean a magnifying power of 2,000 diameters in the case of this great new instrument, which would bring the moon within an apparent distance of 120 miles. With a power of 60 to the inch the moon's apparent distance would be just 100 miles, and supposing that the full power of 100 to the inch could ever be borne with good effect, which is highly improbable, the moon would appear only 60 miles away. Its features would not, however, be seen as distinctly as if it were actually at that distance from the eye, for the unsteadiness of the atmosphere and the imperfections of the image, even under the best of conditions, would impart considerable indistinctness to the view. Those who from mountain tops have seen objects of the landscape 60 miles away can accordingly form a more or less vivid idea of the sort of view of the moon's surface that the new telescope would be able to give at the limit of its powers. But with a much smaller magnifying power—say 1,000 diameters, which would bring the moon within an apparent distance of 240 miles—far more distinct views of the lunar landscape could be obtained. Under the very finest conditions for seeing, such a power might just suffice to reveal a steamship of the size of our largest transatlantic liners traversing a lunar ocean, especially if it emitted a cloud of black smoke. But then we must remember that astronomers are thoroughly convinced that the moon has no oceans, but at the best only dried-up ocean beds. A building as large as some of our huge exhibition halls could be seen as a minute speck. The existence of a large city on the moon would readily be detected by the 40-inch telescope. In fact, if there were any cities there, they would have been discovered long ago with the telescopes already in existence. A great deal of light may be thrown upon some of the vexed questions concerning Mars, Venus, and the other planets by the new telescope. There are very puzzling appearances on their surfaces, some of which seem to demand for their solution but a comparatively slight increase of telescopic power beyond our present limit. But as to the inhabitants of other planets, the 40-inch lens will leave us as much in the dark, so far as the possibility of seeing them or their architectural monuments is concerned, as we have ever been. For any such achievement as that we shall have to wait until a genius comes who can invent an instrument for seeing as much superior to the present telescope as an arc light is brighter than a tallow dip.

IMPURE ICE.

THE EFFECT OF FREEZING UPON IMPURITIES CONTAINED IN WATER.

The extent to which ice is used makes its importance in relation to health almost as great as that of water. An idea prevails that ice cannot be impure, from whatever source it is obtained, as it is supposed to "purify itself" in freezing. About all that is thought of is temperature, and as long as ice is cold little else is considered. Here is an error that has been the cause of much mischief, and as the iced drinks are sipped, their refreshing coolness drives away all thought of possible impurities, just as candies are eaten and the quality of sweetness is all that is desired or considered. Regarding the effect of freezing upon impurities in water the Massachusetts Board of Health has published experiments, as stated by *Public Health*, with seventy-six samples of water and 336 samples of ice from fifty-eight localities. In ice from polluted sources compared with water from the same, the experiments showed: 1. That in the ice the color and salt had been removed. 2. That all but 13 per cent. of the other impurities of the water, as shown by chemical analysis, had been removed. 3. The number of bacteria in the cubic centimeter were: For snow (one sample), 1,246; for clear ice (part of the same cake as above), 6; for clear ice from an unpolluted source, 0. 4. The average of 12 samples from the most polluted sources, 138. The number of bacteria varied much in different parts of the same cake. From the examinations which have been made, it appears probable that when ice first forms in the surface of a pond or river, a considerable part of the impurity in the water near the surface is entangled in the first inch or less in depth, and that the ice which forms below this first inch contains but a very small percentage of the impurities of the water. If snow falls upon the thin ice, causing it to sink, so that the water from below saturates the snow, it will freeze without purification; or if rain falls upon the snow and freezes, the ice thus formed contains the impurities of the snow and of the rain-water, and of whatever else may have settled out of the air. The method often pursued, of flooding the ice of a pond or river by cutting holes through it, gives a layer of ice as impure as the water of which it is formed. The purifying effect of freezing is greater upon substances in solution than upon those in suspension. This is confirmed by the fact that a large part of the organic matter, one-half or three-quarters, and sometimes more than is found in good ice, is of particles in suspension, and is readily removed by filter paper. From the average of all the water and ice used for ice supplies, which they have examined, they find: The organic impurities of snow ice (the sum of the ammonias)=69 per cent. of the impurities of the water. The organic impurities of all the ice (except snow ice)=12 per cent. of the impurities of the water. The organic impurities of clear ice=6 per cent. of the impurities of the water. The color of waters was removed by freezing. The salt of the waters was nearly removed by freezing. Of bacteria there were: 81 per cent. as many

in snow ice as in the waters; 10 per cent. as many in all other ice as in the waters; 2 per cent. as many in clear ice as in the waters. The results obtained lead to the conclusions: That while clear ice from polluted sources may contain so small a percentage of the impurities of the source that it may not be regarded as injurious to the health, the snow ice, or any other, however clear, which may have been obtained by flooding, is likely to contain so large a percentage of the impurities of the source, and with these impurities some of the disease germs which may be in the source that the board feels bound to warn the public against using ice for domestic purposes that is obtained from a source polluted by sewage beyond that which would be allowable in a drinking water, stream, or pond, and that in general it is much safer to use for drinking water, and for placing in contact with food, that portion of the ice that is clear.—*Scientific American.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

November.

Meats.—Beef, mutton, pork, venison.

Poultry and Game.—Chicken, duck, geese, grouse, hare, partridge, pheasant, pigeons, rabbits, turkeys, widgeon, wild ducks, woodcock.

Fish.—Brill, carp, cod, whiting, salmon trout, perch, smelts, oysters.

Vegetables.—Artichokes, broccoli, celery, potatoes, turnips, cauliflower, cabbage, carrots.

Fruit.—Apples, pears, quinces, grapes, nuts.

PRACTICAL RECIPES.

Carrot Soup.—Cut up four large carrots, one onion, one turnip, and mix with them one teaspoonful of celery seeds and a small cupful of bread crumbs; add two quarts of boiling water; season with cayenne, salt and pepper, and boil until the vegetables are soft, then rub them through a coarse sieve; put them back into the broth and add a cup of sweet cream or milk, boil, and serve up.

White Cake.—Two cups of powdered sugar, three quarter cup of milk, three-quarter cup of butter, three large cups of flour, in which one and one-half teaspoonfuls baking powder have been sifted; add the whites of seven eggs, well beaten; flavor with almond.

Hashed Vegetables.—Take equal parts cold boiled potatoes, beets, cabbage, or almost any vegetables, and cut them into dice. Season them with pepper, salt, and mushroom catsup, and fry them in beef drippings or butter till they are nicely browned.

Cod Rissoles.—Pound fine two or three cupfuls of cold codfish; add to it one-third its quantity of fine bread crumbs, and season highly with pepper, salt, and a dash of cayenne; add a little chopped onion, parsley and sage; bind with a beaten egg, form into rissoles, and fry in boiling lard.

Whipped Apples.—Peel and core four good-sized apples, put them in a deep stone dish with just a little water, to keep them from burning; cover the dish, stew gently until perfectly soft; mash them through a sieve, sweeten, and add a little grated lemon peel; beat very light the whites of three eggs, whip them into the apple, set away till very cold, and serve with or without cream.

Tomato Cream Soup.—Cut up three good-sized tomatoes and one onion, and cook them in enough water to make two cupfuls when done. Heat one pint of milk, adding a lump of butter, pepper and salt; thicken a little with two teaspoonfuls of flour; strain the tomatoes; beat a salt spoonful of baking soda into them, and just before serving add them to the milk. Serve with snippets of fried bread.

Fried Carrots—Select large carrots, scrape and cut them in long thin slices; dip them in egg and cracker crumbs and fry in boiling lard.

LIVER AILMENTS.

The poet's happy line, "The shallows murmur while the deeps are dumb," applies to physiology as well as to other fields of life. The great vital organs perform their functions silently and unperceived, while the skin, teeth and olfactory sense are forever giving unpleasant evidences of their existence. The quietest of all the organs is the liver. Until abused or injured, its presence is never manifested,—but when that point is reached, pain, suffering and exhaustion result. The liver is one of the most important factors in digestion. It occupies a central place in the trunk, where it is protected by the ribs and abdominal muscles from blows and bruises. In its work it is a veritable chemical laboratory. Before science had shed her light upon the subject it was supposed that its entire work was the secretion of bile and that the bile was a simple substance. To-day we know that the bile is a very complex compound, containing at least fifty substances of different qualities and chemical activities. Of these several are very remarkable. One, glycogen, is a body which without being a sugar has the singular power of changing into it in the process of assimilation, something like soluble starch, dextrine and British gum. Some physiological chemists declare that it has a power similar to that of diastase and ptyalin of converting insoluble vegetable substances into grape-sugar and other digestible compounds. Besides glycogen there is a long series of active substances of which cholein, choleic acid and cholesterin are the most important. As long as the blood supplied to the liver is pure and of normal quality, the organ acts with perfect efficiency and regularity. If on the other hand the blood be contaminated with humors, sickness is bound to ensue. So complicated are the hepatic processes, that it is impossible to predict the form in which the sickness will appear. It may be a bilious headache, a cholera morbus or a painful cholic; it may be an utter loss of appetite, an attack of indigestion or a profound melancholy; it may be a jaundice in which the skin turns the color of an orange, or a gastric disturbance in which the breath becomes foul and the mouth coated with greenish deposits. A grave fact which should never be forgotten is that when the liver becomes deranged seriously once, it is permanently impaired and is liable to break down upon the slightest strain. This is why people who have lived in the tropics and whose lives have become weakened by the heat and moisture are compelled to take such care of themselves during the remainder of their lives, even if passed in a far colder clime. Another and much more important fact is that the present practice of using powerful drugs "to stir up the liver" as it is called is an unmodified evil. It not only weakens that organ but is destructive to the stomach and bowels. If the habit be indulged in too long a time, it produces a chronic constipation and lethargy of the intestines which become a disease in themselves. Let it be borne in mind that any drug which acts directly upon the liver does harm. No matter what its action, the effect is unnatural and is bound to lead to more serious consequences. The organ reflects and expresses the condition of the blood, even when sick and out of order, these are due to the greater sickness and to the rank impurity of the sanguineous current. Any medication which seeks to cure the ailment by merely putting an end to the hepatic symptoms without treating the cause behind is unscientific and deleterious. In determining the presence of liver disease, the bowels should be examined critically. Whenever the movements are a pale yellow, a green, dark brown or black, whenever there is frequent diarrhœa or constipation, there is every reason to believe that the blood is impure and that the liver is being affected. In every such case the safest treatment to be taken is Ayer's Sarsaparilla. It restores the liver to its natural tone and vigor by removing the humors which were injuring it and by supplying it with clean pure blood. When the cells have been clogged and where foreign matter has been deposited in its minute passages, this famous preparation opens the one and removes or dispels the other. Using the blood to effect the result. Ayer's Sarsaparilla thus cures all the simpler forms of liver disease and, what is of equal value, it prevents not only the starting of these ills but also their development into graver and more dangerous forms.

BUSINESS NOTES.

The World's Steam.—The steam power of the world has more than doubled in the last fifteen years.

Cyclone's Path.—The average width of the path of destruction with tornadoes is said to be a little more than 1,000 feet.

Bees.—About 4,500 species of wild bees are known, of wasps 1,100, of which 170 and 16 respectively live in Great Britain.

Cats and Disease.—A French scientist declares that the domestic cats of the world carry at least 30 per cent. of the common contagious diseases from house to house.

Patent Medicines.—The stamps upon patent medicines in Great Britain gave a revenue of $210,000 thirty years ago; now the revenue amounts to $100,200,000 yearly.

On the Fly.—A correspondent of the *Scientific Enquirer* says that the best and most humane method of killing flies for the sake of mounting the tongues, is to drop them in alcohol. They die with this organ protruded. We do not know whether this method is considered humane because so many humane beings die by the same means.—*National Druggist.*

Gas Diminishing.—The pressure of natural gas wells in Indiana and Ohio is steadily diminishing, the diminution having already amounted to between 30 and 40 per cent. Professor Orton urges the imperative necessity of cities and states taking action to restrict wasteful use of gas; but even the strictest regulations, he says, cannot prevent the exhaustion of the supply in a few years.

Fire Proof.—Investigations of fire ruins show that porous terra cotta bricks and blocks best resist fire, water and frosts; next to these in the order of fire resisting qualities being the various concretes, or some of them, and burned clay work. In the best building work now done in the iron part is encased in porous terra cotta, tile or brick work in roof, floor and tile construction; the hollow tiles are faced with vitreous tile, slate or any good weather-proof coating, or with a single thickness of brick. Incased in fire-proof materials, iron and steel work is claimed to give the best results.

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CONTENTS.

PROF. KOCH'S DISCOVERIES.

According to the latest advices from Berlin, Professor Koch, the renowned bacteriologist, states that his invention of inoculation for tuberculosis includes a method by which all vegetable parasites and bacilli in the human body can be destroyed. The bacillus of diphtheria will be experimented upon next in order after the first results of the experiments on the tubecular bacillus is announced. The bacillus of diphtheria has not yet been recognized plainly and definitely, but the forthcoming tests will probably settle its characteristics and shape, as each of those hitherto identified has its distinguishing peculiarities. Koch will probably come before the public earlier than was expected, as the patients whom he is treating by his new remedy are progressing favorably. In the report of the International Medical Congress, published in the London *Lancet*, Professor Koch detailed the trials he was making of various substances which, when introduced into the body by injection, would destroy the bacillus of tuberculosis. He asserted that he had found several ethereal oils, some so-called aniline dyes, and among the metals mercury in the form of vapor, compounds of silver and gold, and of cyanogen and gold were remarkable in their effects in tube culture, surpassing all other substances experimented upon. Even in dilutions of one or two millions they checked the growth of the bacillus of tuberculosis, but, although effective in tube culture, were absolutely without effect on tuberculosis in the living animal. Koch has been far too successful to be discouraged, and thinks he has hit on a substance which will prevent the growth of the tubercular bacillus in the animal tissue. "We may be," says the *Lancet*, "on the verge of a revolution in therapeutics. Bacteriology itself is now on its trial in this momentous investigation." In the *Lancet* Professor Samuel G. Dixon, of Philadelphia, claims priority of invention over Koch's discovery on the statement that in October, 1889, he advanced certain pertinent hypotheses. Two cases of slight consumption in "La Charite Hospital" are declared to have been cured already by Professor Koch's method.

A BELLAMY PROJECT.

It is reported from San Francisco that the principles set forth in Bellamy's "Looking Backward" are soon to be put to the test of actual experiment. The heroine of this venture—for who but a woman would risk a task so heroic—is Mrs. Olive Washburn, a wealthy lady of the Golden Gate City, a nationalist and a spiritualist. She proposes to give a tract of 1,700 acres of land, and to locate the colony there. The land is said to be in every way desirable, containing all the elements of an earthly paradise. Mrs. Washburn proposes to give from her own ample purse money for the erection of factories, dwellings, farming appliances, etc., and invites all people of good moral character, whatever their religious creed, who are willing to share the work, to become a part of the community. No money is asked of the colonists, and the only requirement is that they do the work allotted them and live for the good of all. This is the most generous offer made to helpless humanity since Bronson Alcott let down the bars of his sandy farm, Fruitlands, and offered a welcome to every tramp or crank who was disposed to share his hospitality. Mr. Alcott had little more to offer his guests than a hearty welcome, plenty of fresh air and water, and an abundance of room, yet they came in overwhelming numbers, sharing the plain living, if not the high thinking, until the sage philosopher learned wisdom by experience, and was glad to restrict his humanitarian sentiments within finite bounds. Mrs. Washburn is said to have a much larger purse than Mr. Alcott had, and can test the experiment on a much larger scale. The numbers who will flock to her community will be proportionately larger, as the hospitality she offers is more inviting.

A CHICAGO RUMOR.

Chicago advices give details of an immense deal in real estate by the great packing firms of Armour & Co., Swift & Co., and Morris & Co. The concerns mentioned have purchased 3,600 acres of land at the southern end of Lake Michigan, in Lake County, Ind., and will remove their immense plants to that point, where they will establish a vast manufacturing centre. The business of these three firms alone amounts to about $150,-000,000 per annum, and it is estimated that they, with others in the same and similar lines of business, who will be drawn there, will within the next five years gather at that point a population of 150,000 souls. The Calumet River runs through the heart of the tract, and will furnish vast dockage facilities in direct connection with Lake Michigan, which is one of the special advantages sought by the projectors of the enterprise, while at the same time the railroad facilities are perfect. The new town will have its own water supply at greatly reduced rates, and the plant will be relieved of a heavy burden of city taxation. In addition to these advantages, it is said that natural gas will be brought into the new town, whose use as fuel will further cheapen the cost of operating the great plants.

We quote from an exchange this item of news because just at this time it is of special interest, for several reasons. Only within this year the Chicago stock yards have been sold at a handsome figure to a syndicate of British capitalists. When the three firms doing the largest business there remove, what will be the value of those stock yards to their owners? It could easily have been foreseen that, with the growth of Chicago, the stock yards must sooner or later be located elsewhere. Another and probably very important reason for the alleged change is that since the town of Lake has been annexed to Chicago the Dressed Beef people were no longer willing to submit to the rule of the new political bosses.

A SUBSTITUTE FOR STEEL.

Kentucky has a new company, just organized at Newport with $250,000 capital, to manufacture aluminum by a new patented process at a nominal cost, said by the local papers to be less than ten cents a pound. It involves the use of calcium fluoride for a flux and a little calcium carbonate in a jacketed furnace. It requires about thirty-six hours to make the first slab. By another process, in which copper ore and old scrap, mixed with alumina clay and fluoride of calcium for a flux and carbonate of lime and cake are smelted together, as in the first process, aluminum can be produced at twelve cents per pound. Condensed vapor comes out in the shape of slabs called aluminum bronze. The bronze is re-heated in an oven to a cherry heat without flame and plunged into a cold bath of strong salt water and glycerine, and this rapid process of heating and cooling is repeated ten or fifteen times. The re-heating causes the aluminum to melt in the copper, and it comes out like beads of sweat. After the slabs are cooled in the bath the aluminum drops are chilled and cannot get back into the copper, which is struck with a hammer, causing the aluminum to drop. Next the drops are gathered and melted into ingots. The company will

also manufacture a new metal known as schmied barrenguss, meaning "a good welding metal." It is an aluminum alloy composite. It cuts as easily as tin, yet by tempering can be made to cut glass. It makes fine horseshoes. It has a tested tensile strength of 200,706 pounds to the square inch, and will stand an elongation of 52 per cent. This metal will do away with malleable iron and steel castings. It is made of refuse, and can be produced for nine cents per pound. Should this process prove a success, it is certainly one of the most important discoveries of recent years.

DIAMONDS.

HOW THEY ARE SPLIT AND POLISHED AND RENDERED VALUABLE.

That a diamond acts as a powerful charm before marriage is most true, and a witty Frenchwoman, referring to its use as an engagement gem, once called it "the cheese in the mouse trap," but after all it is only so much carbon. It differs from the vulgar black coal that we burn in our fire-place only by its aspect and its density, for in its intimate formation it is the same thing. If you do not believe me, burn in oxygen three grammes of diamonds in one vessel and three grammes of plumbago in another, and you will obtain in both cases the same precise quantity of carbonic acid and not a single trace of any other residue. There is a difference, though, between the two operations, and it is this: The first operation will cost you about $2,000 and the second only a penny. Diamonds come high, even those that are off color, but not, however, until they have been cut and shaped and polished, and this is an artistic work that is done by lapidaries. The diamond is always found crystallized, and it is owing to the fact of its crystals being very distinct, with sides and edges well preserved, and permitting of its crystalline forms being distinguished, that it maintains its great durability. This durability or hardness is the common characteristic of all precious stones, but the diamond is the hardest of all gems. After it the next hardest is the ruby; then comes the sapphire and the eastern emerald, which, however, are only varieties of corindon. This hardness of the diamond would render it very valuable for industrial works were it less rare and were it not for its high price. Their hardness varies within certain limits. All lapidaries know that Brazilian diamonds are harder than those from the Cape of Good Hope, and they will also tell you that these latter stones have their difference of hardness. Generally speaking, it may be said that brilliancy and the most beautiful reflections correspond to a similar amount of hardness, for undoubtedly a diamond of finest water is also the hardest kind. A diamond is brittle—that is to say, it can be crushed—and this is the great inconvenience in connection with its employment in rock drilling. Density is a way of testing the identity of a diamond. When cut it is often confounded with the white topaz of Brazil, with the white sapphire, and especially with the zircon; but as these stones weigh heavier than does the diamond, this feature serves to discover the difference. That, however, is not the way skilled lapidaries tell diamonds, for even in the dark they can distinguish one from another stone. They have only to rub the two crystals one against the other close to the ear, and the strident noise which the diamond produces permits of its being easily recognized. A diamond enjoys the property of emitting light in darkness for a certain time—in other words, it is phosphorescent, and it has optical properties on which relies the theory of good cutting. When a luminous ray strikes a diaphanous or transparent body, this ray, passing through the body, is turned aside from its course and becomes broken; or, in other words, is refracted and forms a certain angle with its first direction, which varies according to the nature of the body. If the indication of the refraction of a crystal, or any transparent body, is known, it is easy to calculate the direction or course the luminous ray will follow and which strikes it at a fixed angle. Now the art of the lapidary consists in giving a stone all the brilliancy and dazzle of which it is susceptible; that is to say, he must cut it in such a way that it will retain within itself the greatest amount of light possible. It is by carefully combining the direction of the facets that he manages to imprison in the crystal the luminous rays that have penetrated it before rejecting them outside, and this phenomenon is designated under the name of total reflection. The angle of total reflection for a crystal is less great according as its index of refraction is the more considerable. A diamond being the most refracting of all substances, it will not be difficult to understand that the lapidary can arrange his facets in such fashion as to cause them to undergo this total reflection a considerable number of times, hence the surprising brilliancy of cut diamonds, and the diamond that is well cut is illumined with the most beautiful, the most lively colors. A man named Louis de Berquem was the first to discover how to cut diamonds, and the beauty of his gems created quite a sensation. That was toward the close of the fifteenth century, and he gave to his invention all the full extent and improvement of which it was capable. He and his companions turned out good pupils, and diamond cutting became a prosperous industry, at Antwerp especially. To-day that city has fifteen diamond-cutting factories, with perhaps one thousand lapidaries and as many apprentices. But Amsterdam was then the leading market in Europe for precious stones, as even now it is the centre of the world for diamond cutting. It is estimated that there are more than ten thousand persons employed there, in one way or another, in this industry; and since the discovery of the Cape mines hundreds of millions of francs have been earned by them. France has some clever lapidaries, but there has always been great difficulty in creating works in Paris because the primary material is wanting. The first attempt to establish diamond cutting here was made by Cardinal Mazarin, after him by Colbert, and later on by Calonne, and nearly all the governments since have encouraged establishments of this kind, but there has always been the same difficulty as to material. Still, there are several diamond-cutting works now in Paris, not to mention some established in the provinces, and I believe there are one or two in America. The operation of cutting diamonds comprises three phrases—splitting, shaping, and polishing. All crystals possess the property of easily cracking in certain directions; in the diamond there are three principal and very distinct directions, without counting several secondary ones, and cleavers or splitters call these the "threads" of the stone. A good workman always knows where to find a thread, and this is the way he proceeds: The diamond to be cleaved is fixed in a convenient position at the end of a short stick by means of cement; then to another baton, and by the same process, is fastened a sharp diamond. Taking in his right hand the baton bearing the sharp point, and in his left the one that holds the diamond to be cleaved, he rests them at the middle on a box which is firmly screwed down to his table, thus forming a sort of lever, and then he rubs the two one against the other, until the sharp stone has made a notch in the other. He uses three blades, one after the other, in this way, the first to make a groove, the second to regularize it, and the third to finish it off in a neat and distinct manner. Then, holding in his left hand the baton on which is the stone to be split, and at the same time a steel knife, the edge of which is fixed in the "thread," he hits a good, straight blow on the back of his knife with a small iron bar, and the diamond is separated just where it was intended to be beforehand. This "cleavage" as it is called, is not always necessary; still lapidaries have recourse to it when they wish to take from the crystal its defective particles, or to give it convenient shape for other operations. Cleaved diamonds, or those still in their crude shape, that have no need of undergoing this operation, pass to the "brutage," that is to say, to receive shape or form, and which in the trade is called "ebauche." Two crystals are firmly fixed on a piece of wood, and then they are rubbed against each other until they both assume the required form. This operation goes on over a box called an "egrisoir," because it receives the diamond powder, which is termed "egrisee" in French, and which is produced by the reciprocal wearing away of the two gems. The diamonds are now out of "brutage," but they are still without brilliancy, so it is necessary to polish them, and this is how the process is carried on: A mixture of lead and tin is prepared; this is poured into a leather mold, and the stone is placed on top of this metal cement, which "coquille," as it is called, is then squeezed into a kind of steel pincers, and placed by the polisher on a wheel or steel millstone having rotative movement, but in such a manner that the side of the diamond alone touches it. The speed of this wheel is about two thousand two hundred turns in a minute, and it is covered with diamond dust. When one face had been polished the next face is proceeded with, and so on. The man who does this work must be very skilful and have a good deal of taste and mathematical precision. He must know how to find the thread of the stone, as otherwise it would only make a hollow furrow on the mill wheel. Diamonds have different shapes or forms but the two principal ones are known as the "rose" and the "brilliant." The former applies to small flat gems, and there are "rose" diamonds so light that 1,000 of them do not weigh more than a single karat." A "brilliant" must be a stone of a certain thickness; it comprises a main exterior known as the "table" and a lower part called the "culasse," and sixty-four lozenges or triangular facets must be cut between these two faces. The thirty-two upper facets constitute the "crown" the other thirty-two from the "pavillion." Little brilliants have a "table" and a "culasse," but they bear fewer facets than as the brilliant proper so called. There are other forms for brilliants as for instance the "recoupe" or "double taille," which also has thirty-two upper facets and thirty-two below; the "non recoupe" or "simple taille," which presents only thirteen facets above and nine beneath—this form is used for cutting diamonds of small size that are to be set around other stones of larger dimensions, or for modest parures; the "pierres epaisses," or brilliants, one side of which is polished, the other being cut in the shape of a prism; the "demi-brilliant," flat beneath and having a "table" or "crown" above really a "recoupe" split in two equal parts; the "pierre a portrait" or brilliant formed of two parallel faces, joined by a thin crown, which is faceted; and the "briolette." This diamond, which was formerly shaped only in India, has neither top nor bottom, but has the shape of a small pear, covered with facets all over its surface. The "briolettes" of India are pierced by a very small hole, but Amsterdam lapidaries never pierce them. The "pendeloque" has the form of half a pear, with a "table" and a "culasse," and his covered with facets on the latter side. The "rose" is flat in its lower part; it has twenty-four facets on the remainder of its contour, and the joint of its pyramidal dome is formed by the meeting of six of these triangular faces. Six more triangles, applied base to base to the others, have their apex on the contour of the under "table," and the six spaces left by them are each cut into two facets. The rose proper, or "rose of Holland" has only twenty-four facets; the "rose half Holland" has eighteen instead of twenty-four; the "rose of Brabant" has only twelve, and the "rose of Antwerp" has but six facets. The brilliancy of a diamond is so characteristic that German mineralogists have termed it "adamantine brilliancy." Usually they are colourous, as well as transparent and vitreous, but it occasionally occurs that they have a blue, green, yellow, pink or dark tint, and there are some which are completely black. Moreover, they are often rendered less valuable by reason of dark or red points and spots and irregular crystallizations.

Green diamonds present this peculiar feature, that they become brown when submitted to a strong calcination. Cape diamonds generally have a yellowish tint, and this, to a certain extent, diminishes their value, as the following example will show: A cut diamond of five karats—the karat represents a weight of about twenty-one centigrammes, or, strictly speaking, 0.20275—very white and of the first water, is worth from 1,000 francs to 1,500 francs the karat; the same stone, if it were yellow, would not be worth more than 200 francs to 250 francs the karat. Efforts have been made to take away from a diamond the coloration that reduces its value so greatly, but thus far unsuccessfully, though a way has been found out of masking the regretable tint by basing it on the theory of complementary colors. Daylight, which appears to be white, is really composed of several rays of divers colors, and among these there are three called primitive. They are red, blue and yellow, and cannot be compounded. Hence, white light is only composed of the three colors just mentioned. Now, Cape diamonds being yellow, it is only necessary to cover their surface with a transparent violet color, which, combining with the yellow of the crystal, gives a white light, and this artifice has sometimes been used by rascally dealers to get rid of goods of little value and at very high prices. Diamonds cannot be attacked by any chemical substance whatever, being almost pure carbon. This fact has induced many persons to try and crystallize carbon so as to obtain a precious gem out of it, and they have partly succeeded, but while these artificial diamonds possess a brilliancy and transparency worthy of comparison with those of the real thing they are microscopic, very small, and always colored. Perhaps they would resemble real diamonds more could they be made larger and quite colorless. As now manufactured, they are not of the slightest value to commerce. There cannot be any serious doubts as to the possibility of producing diamonds artificially, but up to the present no really practical means have been found of making them respond to the necessities of trade in the two continents. The value of diamonds does not generally undergo abrupt fluctuations except under extraordinary circumstances. In 1866, when the mines of Bahai were discovered, there was a panic, and their value went down in a remarkable manner. Since then, however, their value has never ceased to go on increasing regularly. Diamonds are sold by weight, and the unity of weight is the karat, so called from the name of a bean with which the natives of the East Indies used formerly to weigh their gold. The karat is divided into one-half, one-fourth, one-eighth, one-sixteenth, one-thirty-second, and one-sixty-fourth part of a karat, and a jeweler's scales contain from 1,000 karats down to the lowest of the preceding fractions. When a merchant weighs a diamond he holds the scales in his hand, and if he is skillful in his business he is never out by so much as one-sixty-fourth part of a karat. But the karat has not the same value in all countries; its value in France, in milligrammes, is 205,500; in Brazil, 205,750; in England, 205,409; in Holland, 205,044; and in Spain, 205,393. Uncut diamonds are sold in lots, or "parties," according to commercial expression; they are classed according to size, and bring from $18 to $20 per karat. They lose about half their weight by being cut, and the value of an uncut stone is calculated by the probable waste in cutting, taking care to consider possible defects of all kinds. Cut diamonds are also sold by weight in karats and in parties, and are classed according to sizes. Small diamonds weighing half a karat at most are worth each about $50 the karat. A brilliant of one karat is worth from $90 to $100; a brilliant of one and one-half karats is worth from $160 to $180; one of two karats from $300 to $340; one of two and one-half karats from $360 to $400; and, finally, a brilliant of three karats from $540 to $600. Nothing precise can be said as to the value of a diamond, especially when it attains a weight outside of ordinary limits. However, the following rule has been adopted as a basis: The value of two diamonds of the same water are between themselves the same as are the squares of their weight, which is to say that a diamond the weight of which is double that of another is not worth twice but quite four times as much; but this is only when all things are equal, for immediately a diamond is tinted its value becomes greatly lessened. If we estimate the value of a cut stone of fine water and without defect at $90 the karat, its value would be obtained by multiplyiug the square of the weight by 90. For instance, a diamond of ten karats is worth 10x10x90=$9,000, while a diamond weighing 100 karats will bring 100x100x90=$900,000. However, this rule is law only for stones weighing 100 karats and under. Above that limit it is neccssary to arrange the equation by another factor, and this is altogether arbitrary. The Regent, best of all of the French crown diamonds that were dispersed two or three years ago, is estimated at being worth in the neighborhood of $2.500,000; but if weighed and valued by ordinary calculation, it would sell for only about $720,000. The only natural diamonds that are sold not to be cut or pulverized are those known as glazier's diamonds. They are very small stones, have convex faces and bended edges, the apexes of which are distinctly visible. These diamonds will cut glass, but diamonds, the edges of which are rectillinear, will only scratch it. Glazier's diamonds are sold at from $12 to $16 the karat. Certain diamonds, which in a natural crude state are in a spheroidal form, and which do not possess any "clivage," cannot be cut, and are pulverized to make diamond dust. There are also amphorous diamonds that are completely opaque, and are of steel gray or slightly reddish black, and these are called carbonic diamonds, carbon or carbonate. Besides diamond dust, tools are made out of them with the aid of which rocks, against which the finest tempered steel has had the edge taken off, are split and polished. As for black diamonds, worth from $4 to $5 per karat, they are used with success in the mechanical perforation of rocks, the boring of mine pits and galleries, the splitting of coals and stones, repairing and dressing of mill-stones, porcelain cylinders, etc.; the sawing and piercing of marble, porphory, granite, porcelain, glass, and a whole lot of other substances and for steel engraving.

HENRY HAYNIE.

YANKEE SKILL.

AMERICAN PRODUCTS PREFERRED IN EUROPE.

A subscriber asks how it is, when wages are higher here than in almost any other country, that the United States can find a market abroad for so many articles of hardware and machinery, in competition with the active business rivalry of England and Germany. As *Hardware* recently asserted, the secret of the extent of our exports under such circumstances lies in the excellence of American manufactures—they sell upon their own merits. To be more explicit, the sale of such goods as are now exported from the United States is not governed by the price. When the Japanese can buy rope-making machines in Boston by the hundred, and get them operated in their own country by laborers hired at three dollars per month, it is not likely that the United States will soon be distinguished in foreign markets for offering goods cheaper than native labor can produce them. American hardware is exported to-day because it is better than the goods of the same class made elsewhere, and the people who buy it are willing to pay the price rather than buy undesirable goods for less money. Either this is the case, or the articles exported are patented specialties which cannot be manufactured abroad because of the protection secured by patenting the inventions all over the world. This question of patents is the most important one to be considered in connection with the future foreign trade of this country. In Germany, for instance, our inventors, manufacturers and merchants were welcomed under the empire. An American brand upon an implement was its highest recommendation. Depots and agencies were established there for the sale of American goods until there were probably fifty in different parts of the empire, all doing an active business. That was little more than ten years ago, but now nearly all the agencies are closed. The extremely clever German machinists set at work promptly to imitate our hardware, stoves, agricultural implements, boot and shoe machinery, and sewing machines, even copying some of the American trade marks. These imitations, though not equal to the originals, were far cheaper in price, and the sale of American goods was greatly checked. The trouble was that the latter had not been protected by patents in Germany. It is not too late to take warning from this. Our Consul-General at Frankfort, Mr. Frank H. Mason, writing of the Electro-Technical Exposition to be held there in 1891, writes thus strongly: "Let it be understood at the outset that it is useless to bring here for general sale any invention that is no severely patented by a German patent. If it is valuable, it will be assuredly copied unless the patent is vigorously defended." The case is cited of a meat-cutting machine, manufactured in Philadelphia, which was introduced in Germany a few years ago and was at once copied, as it was an article that immediately became popular. But the American makers went over, defended their patents before the courts, stopped the infringement, and now have a heavy and steadily growing trade. But a grating machine, sent over from Massachusetts, has been copied on a large scale in Berlin, and, as the patent has not been defended, the original machine has been driven out of the German market. The best-selling American goods in foreign markets to-day may at any time be imitated so successfully as to stop the demand from this country. It is so with nearly everything we try to sell in China and Japan. Even bicycles and expensive scales are imitated in the latter country and sold very cheaply. Our manufacturers cannot begin too soon to study the patent laws of the Old World, but meanwhile there is no reason to relax their efforts to sell their products in every land under the sun.—*Hardware.*

CHEAP AND HANDY.—Something new in pen wipers is a raw potato, which is said to hold the pen steady, to remove the ink and to prevent and delay the process of corrosion.

THE BRINY DEEP.—If a box six feet deep were filled with sea water and allowed to evaporate under the sun, there would be two inches of salt on the bottom. Taking the average depth of the ocean to be three miles, there would be a layer of pure salt 230 feet thick on the bed of the Atlantic.

STEEL TUBES.—Weldless tubes of steel are now made in Germany by the Mannesman process out of solid bars. A pair of rolls revolve at the rate of 200 or 300 revolutions a minute. A bar of hot and therefore plastic steel is delivered to them, and by their action it is stretched and a hollow is made in the centre. The tubes made by this process are peculiarly strong and light.

THE RECORD.—The fastest mile a single man has traveled by various methods of locomotion is to date respectively recorded as follows: Swimming, 26.32; walking, 6.23; snow shoes, 5.39$\frac{3}{4}$; rowing, 5.01; running, 4.12$\frac{1}{2}$; tricycle, 2.49$\frac{2}{5}$; bicycle, 2.29$\frac{4}{5}$; skating, 2.12$\frac{3}{5}$; trotting horse, 2.08$\frac{3}{4}$; running horse, 1.39$\frac{3}{4}$; railroad train, 40$\frac{1}{4}$ seconds; balloon, pneumatic tube and electricity records are yet to be made.—*The Iron Industry Gazette.*

A DISINFECTANT.—Bromine as a disinfectant is said to be coming to the front. It is an inexpensive by-product of the manufacture of salt, selling at 70 cents a pound, and in solutions containing one part in weight to about 800 of water it may be used freely without effecting anything which it may touch. A few gallons used daily will remove all ammoniacal odors from stables, or a few quarts will thoroughly deodorize the entire plumbing system of an ordinary house. The undiluted bromine is strongly corrosive, and if it touches the skin causes a painful burn.

ZERO.

WHAT IS THE ABSOLUTE ZERO POINT?

In an interesting essay on "Prophecy in Science," in the English Mechanic, Prof. Edward Aveling points out how the days of prophecy have not yet passed, as is frequently asserted, but are really only beginning; that is, the days of prophecy, not in the form of vague phrases, wild and mystical, but of clear and distinct foretelling of events to come, and of discoveries that will be made. This scientific prophecy is based upon a careful study of facts and generalizations. Scientific prophecy is a true method of deductive reasoning based on unalterable laws and facts, anticipating the past as well as the future. After dwelling at length on the great laws of gravitation, natural selection, of periodicity in the domains of chemistry, the author demonstrates how so many of these scientific prophecies have been fulfilled. Coming to the domain of physics, he gives an instance of an as yet unfulfilled prophecy, but which may be received as an example of the literary prophetic stage. The author says: There seems great reason to believe that there is an absolute zero or 0° of temperature, and that this absolute zero is 273° below the zero on the centigrade scale. Further, there is yet more ascertained reason to believe that no gas can exist as a gas at this temperature of —273° C. These conclusions are arrived at by purely deductive reasoning. The deductive reasoning is based upon a great induction; that induction is the law of Gay Lussac or of Charles, that puts into verbal form a certain observed principle as to the behavior of the gases under rise or fall of temperature. The "law" runs thus: A gas whose temperature is raised or lowered from 0° C., expands or contracts $\frac{1}{273}$ of its volume at 0° C. for every degree, rise or fall, of temperature. If then at 0° C. we have, *e. g.*, 273 volumes, say 273 cubic centimeters of gas, and their temperature is raised to 1°, the expansion is $\frac{1}{273}$ of 273, or is 1 cubic centimeter, and the 273 cubic centimeters at 0° become 273 + 1, or 274 cubic centimeters at 1°. At 10° the 273 cubic centimeters will have expanded to 273 + 10 = 283 cubic centimeters; at 100° to 273, and so forth. If, on the other hand, the temperature is lowered from 0° to, *e. g.*, —1°, the gas contracts $\frac{1}{273}$ of its volume at 0°, $\frac{1}{273}$ of 273 is 1 cubic centimeter, and the 273 cubic centimeters at 0° become 273 — 1 or 272 cubic centimeters at — 1°. At — 10° the 273 cubic centimeters will have contracted to 273 — 10 = 263 cubic centimeters; at — 100° to 173 cubic centimeters, and so forth. What then would become of any volume of gas whose temperature was reduced to — 273°? 273 — 273 = 0. Hence by deductive reasoning the volume of a gas at — 273° would be nothing—*i. e.*, at that low temperature no gas could exist, and when—272° was reached, or perhaps sooner, any gas would have passed into the liquid state. Experiment thus far is in favor of this remarkable conclusion. A temperature of — 273° has not yet been reached by artificial means; — 140° is the lowest yet satisfactorily recorded, and is the temperature of a bath of carbon disulphide and liquid nitrous acid (hydrogen nitrite). But at these low temperatures the majority of gases are reduced to a liquid condition, and although the most refractory gases—hydrogen, nitrogen, oxygen, carbon oxide, nitrogen dioxide, methane or marsh gas—have thus far only be liquefied by using other liquefying devices as well as reduction of temperature, yet, if ever an artificial temperature of 273° can be attained, we may expect that no gas will exist at that temperature. From the above conclusions another prophecy may be drawn: — 273° C. is propably the zero of temperature. It is the absolute zero in an artificial sense. Physicists are agreed upon reckoning this temperature as the 0° on an absolute thermometric scale. Fahrenheit's absolute zero, the 0° upon his system—*i. e.*, 32° below the melting point of ice, was the temperature of a mixture of equal parts of sal ammoniac and snow, and was, as he thought, the lowest temperature ever to be attained. The Celsius and Reaumur zeros are artificial and convenient temperatures—that of melting ice. But the 0° on the absolute scale is a zero of temperature, based upon a great scientific generalization, and one may venture to foretell that, in all probability, the lowest temperature possible under existing material conditions will be —273° C., or 0° absolute temperature.

PAPER.

HOW ITS SEVERAL QUALITIES ARE TESTED.

The absolute strength of paper is measured by its resistance to tearing. In machine-made paper the strength and stretching power vary according as the force acts lengthwise or across; in hand-made paper there is little difference. In the former the difference is in the proportion of 2 : 3, according to the direction of the tearing force. The stretching power acts inversely to the strength, *i. e.*, is greater across than lengthwise. In order to test the resistance of paper to the most varied mechanical wear, it is crumpled and kneaded between the hands. After such treatment a weak paper will be full of holes, a strong paper will assume a strong leathery texture. The test also gives a rough insight into the composition of a paper, much dust showing the presence of earthy impurities, while breaking up of paper shows overbleaching. The thickness of a paper is ascertained either by measuring the thickness of a certain number of sheets, or by taking that of a single sheet by means of a micrometer, where the paper is placed between two rules, one fixed and the other movable, acting as a pointer showing the thickness of the paper on a dial. Over three per cent. of ash shows the presence of clay, kaolin, heavy spar, gypsum, etc. Microscopical investigation of paper aims at determining the kind and quality of paper. For this a magnifying power of 150 to 300 diameter suffices, when, by coloring the paper with a solution of iodine, a yellow coloration shows the presence of wood fiber, a brown coloration that of linen, cotton, or flax, and no coloration that of cellulose. The determination of the kind and quality of size may be made by boiling in distilled water and adding a concentrated solution of tannic acid, when a flocculent precipitate shows the presence of animal size; and by heating in absolute alcohol and adding distilled water, when a precipitate shows the presence of vegetable size.—*Paper Mill.*

THE GULF STREAM.

DOES IT ISSUE FROM A SUBMARINE CAVERN?

Has it ever occurred to the reader that the earth is not "solid," as we commonly say, but "honeycombed" with enormous cavities or caverns of all dimensions? If so, why should these caverns not be numerous everywhere in the crust of the earth, some easily discovered, as the great Mammoth Cave of Kentucky, and others never yet seen by mortal eye? These huge cavities, originally formed when those portions of the earth's crust were in a melted state, and results of the unequal cooling of different materials of the composition and of other causes, if so situated may form the basis of very interesting theories. For instance, they may be generally filled with water, and there may exist great underground inland seas. The source of the Gulf Stream has always been a disputed question. This great body of warm water is nothing more nor less than a stream or river in the ocean, flowing through the colder water. It was formerly thought that this stream was formed in the equatorial regions, where the surface water of the ocean was heated by the sun, and then began to flow northward. But of late a theory has been advanced that this stream, which is just as well defined off the Florida coast as off the Grand Banks, is a stream of hot water which issues from an orifice at the bottom of the sea somewhere among the Florida reefs. Recently the Hydrographic Office of the Navy Department has been endeavoring to determine if it is so, and efforts have been made to find this orifice by the use of the sounding line. But if a stream of hot water of the proportions of the Gulf Stream does issue from an orifice in the bed of the sea, then what a mighty boiler there must be somewhere in the bowels of the earth, and whenever these enormous fires burn through the rocky walls of the boiler, and the water rushing in is instantly converted into steam, no wonder if explosions ensue that cause the overlying waters and the earth's crust to vibrate in great waves, which we call earthquakes. Very probably this is the case, for abundant evidence of these explosions caused by the contact of fire and water when the earth's crust was first commencing to form is everywhere apparent, only the effect of atmospheric changes has covered the hardness of the face of the earth with a kindly soil, and vegetation has clothed this soil with the smile of life. But wherever the mountains are we see the evidences of these steam explosions. There is one great rock in the Yosemite Valley several thousands of feet high, standing alone, from which some great convulsion of nature has split off a huge fragment and hurled it no one knows whither. But in the course of time the earth's crust has grown thicker, and we at present know little of these subterranean explosions, except when the solid earth trembles in an earthquake. Or perhaps it is the formation of steam that raises the lava to the mouth of the volcano and forces it out upon the plain, until another wall has been built between the fire and water in the depths of the earth. Then, too, the hot springs may show the existence of subterraneous waters. There are numerous other peculiar circumstances which seem to be explained by this theory. For instance, it is said that a great storm on the Atlantic coast of the United States is accompanied by action of the geysers of the Yellowstone Valley, and this might be explained if it could be proved that a subterraneous waterway from ocean to springs existed. It may be that this sub-water protects the surface of the earth from a great heat. However, if the earth be not "solid," as we generally suppose, but permeated with seas, channels and passageways of various kinds, it gives a reasonable basis for some of Jules Verne's stories, and probably explains many occurrences that at present are only mysteries. It remains for the future submarine vessel to solve this problem.—*Boston Journal.*

ARTIFICIAL GOLD.

A MODERN SUGGESTION OF THE PHILOSOPHER'S STONE.

"With the gods and the chemists all things are possible," said the illustrious chemist Hofmann. Nor does the statement seem much overdrawn when one considers the stupendous results obtained during the last quarter of a century by chemical investigators. The extraordinary researches of Newlands, Mendelejeff and Meyer have shown that the atomic weights of the chemical elements of which all matter is composed occupy definite and unchangeable positions in a geometric figure, and that the properties of matter may be considered as mathematical functions of numbers. These discoveries throw open for investigation a territory that contains treasures beyond the power of the imagination to describe. Weisbach, following these investigators, split up the metal didymium into two other elements, proving, what had long been suspected by chemists, that some of the heavy metals could be resolved into simpler elements, had we the requisite forces wherewith to break them up; and, as the conclusive demonstration of his discovery, he then reunited the new elements, phraessodymium and nemodymium, and gave us back the compound substance, didymium. Crookes published a series of brilliant experiments on the metal yttrium, similarly breaking up this element into a number of substances, which he reunited again to reproduce the original yttri-

um. Last comes Greenwald, who infers from spectroscopic investigations that all our elements can be reduced to but two primal forms of matter. Now that this field has been opened to investigation, there can be no limit assigned to the discoveries that may follow. The forces at our control are growing daily more powerful and more manageable. Victor Meyer has been able to heat iodine until it exists in its atomic condition. What the next condition will be no one can tell. These facts, and many others that could be given, make it probable that the so-called chemical elements are not really elements, but compounds, which in time we shall be able to separate into their constituents, and, conversely, to reproduce by combining other substances. Among the heavy elements—and hence those that would be expected to yield to the searching attacks of the chemist—is gold. It is not improbable that in time it will become possible to make gold in large quantities—an event which would throw it out of use as a standard of value, so far as it derives its own value from its rarity.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

November.

MEATS.—Beef, mutton, pork, venison.

POULTRY AND GAME.—Chicken, duck, geese, grouse, hare, partridge, pheasant, pigeons, rabbits, turkeys, widgeon, wild ducks, woodcock.

FISH.—Brill, carp, cod, whiting, salmon trout, perch, smelts, oysters.

VEGETABLES.—Artichokes, broccoli, celery, potatoes, turnips, cauliflower, cabbage, carrots.

FRUIT.—Apples, pears, quinces, grapes, nuts.

PRACTICAL RECIPES.

VEAL BROTH.—Put two pounds of knuckle of veal, chopped up in small pieces, to boil in two and a half quarts cold water; when it reaches the boiling point set it back where it will simmer gently for four hours; add while cooking a bit of red pepper, a stalk of celery, an onion cut in pieces, and a teaspoonful of salt. Strain the broth, add some small dumplings, let them boil for fifteen minutes; season to taste and serve.

DUMPLINGS FOR SOUP.—One-half pound sifted flour, one small teaspoonful salt, one teaspoonful baking powder, and one cupful milk; work into a soft dough, form into little balls and cook.

STEWED CELERY ROOTS WITH CHEESE.—Wash your celery roots after removing the stalks, and boil them twenty minutes; let them cool, then cut them into small pieces; lay them in a baking dish, pour over them a little milk and seasonings of salt, pepper and a lump of butter; sprinkle over the top an equal mixture of grated cheese and bread crumbs, and bake.

VENISON CURRY —Brown in a saucepan two teaspoons of flour and one of butter; add a grating of onion, half a teaspoonful of curry powder, and half a pint of soup stock or hot water. Simmer on the back of the stove; cut your cold venison into small pieces, and let them get quite hot in the gravy before serving. The juice of a Florida orange added just before sending to the table is an improvement.

CODFISH FRITTER.—Soak over night one-half pound of salt codfish, then boil it and pick it fine; add black pepper, some chopped parsley, and a tablespoonful of butter. Chop fine two onions, fry them soft, and brown them nicely in butter; then add to the onions two tomatoes, peeled and cut small, and let them stew down together. Mix this with the fish; then beat up well four or five eggs, add them to the whole mixture, and fry immediately (either in hot oil or butter) to a light brown color, dropping the mixture for frying into the pan in small cakes.

FROSTED CHESTNUTS.—Remove the shells from some roasted chestnuts, dip them in beaten white of egg, roll them in powdered sugar and let them dry on an inverted sieve in a moderate oven. Blanched almonds or walnuts may be frosted in this way.

CHOCOLATE PUFFS.—Beat very light one egg, make this thick with grated chocolate sweetened and flavored with vanilla. Cut some thin light crusts into shapes, spread with the mixture; cover with a thin crust, press the edges together, and bake a light brown.

AMERICAN CANDY ABROAD.

A BRITISH NOTION OF THE CANDY CAPACITY OF AMERICAN LADIES.

One of our most valuable English exchanges, the *Practical Confectioner*, published in London, says in its October issue: The cult of candy is establishing itself here. The American influences at work in London have popularized the sweatmeat, and just now sweets are as necessary an addition to afternoon tea or the dinner table as the dainty sandwhich or the hothouse strawberry. The artistic and decorative capacity of the bonbon have only just been recognized among us, and New York has done what Paris could not do, and taught us to eat what the American belle regards as a prime necessity of "a good time." We are even, and the statement is made upon indisputable authority, taking to gum chewing. Men as well as women are adopting this fashion, but not quite according to true Yankee lights, for the real gum-chewer of the States carries about the sticky plug in his mouth for hours, sometimes whole days, giving it occasional turns, but never swallowing it. The British imitator is too hasty, and injures her internal organs by loading them with an excess of this glutinous material. A curious property of genuine American gum is that it provokes appetite, and so is not wholly unaccountable for the enormous meals which are served in the States. The secret which renders American sweets more attractive than the ordinary run of such wares is that they are made fresh almost every hour. If they are of the soft *fondant* order, even the outside is not allowed to dry and harden, and if they are crisp and 'snappy,' they can be eaten while they possess this desirable quality. Nuts of all kinds are largely used for them, and these are certainly better before they acquire the dull rancidity which characterizes, say, the almond-rock of the cheap confectioners. Their nomenclature is almost as diversified and vividly expressive as that bestowed upon drinks, and cocoanut kisses, cream taffys, Josephines, nunkies, honey morsels, and buttercups tell softly seductive tales to the "sweet tooth." Some of the flavors used, however, do not commend themselves to English tastes, nor is maple sugar a particularly pleasant thing till one has acquired a liking for it, and this is used in some of their bonbons. The quantity of sweets that a party of typical Yankee women can consume in an afternoon would astonish most people. One very well versed in the confectionery trade of New York said, "Well, a six-pound bag don't seem too much for two or three when they sit down for a good talk." To the American lover they must be a heavy tax, for the lady seems to regard them a perquisite of courtship which must be made worthy of her acceptance, and hundred-dollar boxes are by no means unusual as presents, even when the parties are merely friends upon the footing which permits them to drive out and go to the theatre all unchaperoned. The sweetmeat 'favor' is a degree we have not reached here yet, though to hostesses in search of a novelty it may be commended. This is some queer little device, as a yacht in full sail, a hansom cab, or a perambulator, either to contain three or four specially delicate bon-bons, or to stand upon a slab of chocolate or a 'nut bar,' and is given to every guest at a dinner or supper. The fantastic trifle is carried away as a souvenir; while another fashion is that of building up a pile of flower-decked, fancy round boxes of sweets into pyramids, allowing one or more to every one. The flowers are so arranged that they hide the boxes and add to the decorations of the table. All these important accessories to the sweets show the value placed upon them, and for the sake of British digestions and complexions it is to be hoped that we shall not attempt to exaggerate the fashion we are beginning to accept.

WELSH RABBITS.

AN ARGUMENT FOR THE USE OF THE WORD AS PRONOUNCED.

One of the most curious and curiously successful feats of the amateur etymologist is that which has changed Welsh rabbit, which is right, into Welsh rarebit, which is wrong, in the opinion of the *Illustrated American*, and has forced the wrongful change upon the English speaking world. It has ever been a common habit with the amateur etymologist, when the meaning of a word does not seem obvious to him, to remedy the difficulty by a slight change that makes it apparently reasonable. Coming across the word Welsh rabbit, he gazed through solemn spectacles at this mare's nest and decided that a bit of toasted cheese could not by any stretch of the imagination be considered a game animal, but it might well be a rare bit. So he jumped at the conclusion that time and the corruptions which time effects must have done their work on this world, and decided to restore its original beauty and significance. Hence, we have Welsh rarebits on all our menus. Even Webster and Worcester have accepted this unscholarly and erroneous emendation. Now, this is all wrong. Welsh rabbit is a genuine slang term, belonging to a large class of similar terms describing in a humorous manner the special dish, product or peculiarity of a particular district. Thus, in England, a "German duck" or a "Field lane duck" is ordinary eating house mock heroic for a sheep's head stewed with onions, and a "Leicestershire plover" is a bag pudding, and "Gourock hams," "Dunbar wethers," "Digby chicken," and Norfolk capons" are so many names for our herring. Potatoes are euphemistically called "Irish apricots" and "Munster plums," and shrimps are "Gravesend sweatmeats." In New England, codfish are frequently known as "Cape Cod turkeys." In French slang, a herring appears as "poulet de careme," and a crust of bread rubbed with garlic is called a capon. In Italy, so Fuller informs us, "the friars (when disposed to eat meat on Fridays) call a capon a 'pisca e corte'—a fish out of the coop." Similar examples abound in every country. Yet, in face of all these analogies, the amateur etymologist refuses to accept the common sense explanation that the name Welsh rabbit is simply a humorous recognition of Taffy's fondness for toasted cheese.

ICE FOR INVALIDS.

THE BENEFICIAL EFFECT OF CRACKED ICE IN SICKNESS.

One thing that many nurses apparently do not know, is the value of cracked ice in cases where a prolonged drink of any fluid is next to an impossibility. Finely cracked ice, administered in a teaspoonful of champagne or brandy, has been the rallying point for many a sinking patient. Or the ice alone, finely crushed so that it simply melts away in the mouth, trickling down the throat rather than being swallowed as a draft, is a most useful stimulant. The use of ice itself is a quite different matter from deluging the stomach with a cold fluid. The melted ice is not of the ice water temperature when it is swallowed. People who take cracked ice get the

stimulus of ice upon the nerves of the mouth and the tongue, and not the flooding by water of the feeble throat and stomach. Did not one ingenious nurse, at the time a matron, in the University Hospital, some years ago, actually feed a patient, who revolted at the mere thought of food and who was starving in his exhaustion, by deftly sprinkling pounded ice over the bits of broiled chicken liver that she had prepared to tempt his taste? It was the novelty and the sparkling ice that carried the day. The man tasted, enjoyed and ate it all. Each country adds its contribution—according to climate and physical peculiarities—to the science of nursing. It has been said that no one in England can imagine the depths of weakness into which American patients may suddenly go and may be pulled up and out of, because the English climate is not so exhausting in its demands. The uses of cracked ice in cholera cases are familiar to some. It is possible that with hot water bags at the feet, hot mush poultices on the stomach, and a constant diet of cracked ice, no further treatment might be needed to complete a cure. Nursing skill counts for much, and every woman should have as much knowledge of it as will be sufficient to keep patients from sliding down hill until the proper officials arrive.

ELECTRIC PHOTOGRAPHS.—Electricity is being brought more and more into intimate connection with photography. It is now used in lighting studios, and for securing artistic effects of light and shade in the subject to be photographed. In order to avoid dark, hard shadows, the light is projected onto a sheet of alabaster, and from this is refracted onto the subject. The result is soft and exquisite in tone.

PLATINUM.—Five years ago platinum was seldom used in this country, being employed only in the evaporating stills for the concentration of sulphuric acid and in the manufacture of jewelry. It was then to be bought in the market for $3 and $5 an ounce. A year ago it advanced to $8 an ounce; six months ago it had increased to $14, and it has now gone up to $20, which is only a few cents less than gold quotation.

FOOD AND DRINK.

THE HABIT OF DRINKING WATER AT MEALS.

Opinions differ as to the effect of the free ingestion of water at meal times, but the view most generally received is probably that it dilutes the gastric juice and so retards digestion. Apart from the fact that a moderate delay in the process is by no means a disadvantage, as Sir William Roberts has shown in his explanation of the popularity of tea and coffee, it is more than doubtful whether any such effect is in reality produced. When ingested during meals, water may do good by washing out the digested food and by exposing the undigested part more thoroughly to the action of the digestive ferments. Pepsin is a catalytic body, and a given quantity will work almost indefinitely, provided the peptones are removed as they are formed. The good effect of water drunk freely before meals has, however, another beneficial result—it washes away the mucus which is secreted by the mucous membrane during the interval of repose, and favors peristalsis of the whole alimentary tract. The membrane thus cleansed is in a much better condition to receive food and convert it into soluble compounds. The accumulation of mucus is especially well marked in the morning, when the gastric walls are covered with a thick, tenacious layer. Food entering the stomach at this time will become covered with this tenacious coating, which for a time protects it from the action of the gastric ferments, and so regards digestion. The tubular contracted stomach, with its puckered mucus lining and viscid contents, a normal condition in the morning before breakfast, is not suitable to receive food. Exercise before partaking of a meal simulates the circulation of the blood and facilitates the flow of blood through the vessels. A glass of water washes out the mucus, partially distends the stomach, wakes up peristalsis, and prepares the alimentary canal for the morning meal. Observation has shown that non-irritating liquids passed through the "tubular" stomach, and even if food be present they only mix with it to a slight extent. According to Dr. Leuf, who has made this subject a special study, cold water should be given to persons who have sufficient vitality to react, and hot water to others. In chronic gastric catarrh it is extremely beneficial to drink warm or hot water before meals, and salt is said in most cases to add to the good effect produced.—*British Medical Journal.*

WOODEN WOOL.—A "wool" made from wood fiber is now being introduced in Germany, which is said to be as light as cotton and a far better absorbent, and hence, better adapted to hospital uses and general sanitary services. It has an enormous capacity for taking up moisture and holding it indefinitely, even under considerable pressure, and never cakes when dry. It is especially valuable in obstetrical surgery, and it is the finest material ever adapted to such uses wherever hemorrhage is to be checked. For the absorbtion of body secretions it is better than any textile fabric, and cannot convey infection, because it is made to be destroyed after one application. Finally it costs far less than absorbent cotton, so its destruction is a matter of small importance.

WATER HYPNOTIC.—A "lier-awake" of twenty-five years' standing, who for ten years thought himself happy if he could get twenty minutes sleep in twenty-four hours, is thus quoted by the *Medical Age:* "I took hot water—a pint, comfortably hot, one good hour before each of my meals, and one the last thing at night—naturally unmixed with anything else. The very first night I slept for three hours on end, turned round and slept again till morning. I have faithfully and regularly continued the hot water, and have never had one bad night since. Pain gradually lessened and went; the shattered nerves became calm and strong, and instead of each night being one long misery spent in wearying for the morning, they are all too short for the sweet, refreshing sleep I now enjoy."

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RESULTS OF THE CENSUS.

The census bureau has issued its bulletin of the population of the United States exclusive of Indians, white men in the Indian Territory and Alaska. The total is 62,480,540, or about 1,500,000 less than was anticipated when the enumeration was begun. For the purposes of tabulation the States and Territories are grouped into divisions, designated respectively the North Atlantic, South Atlantic, Northern Central, Southern Central and Western. The North Atlantic division, which includes New England and several that were classified in our boyhood's geographies as Middle States, is credited with 17,364,429 inhabitants, or about 28 per cent. of the population of the Union. The Northern Central division, made up of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, the Dakotas, Nebraska and Kansas, is given 22,322,151. These two divisions, which include the States that were generally known in the political language of the last generation as the "North and West," in distinction to "the South" and "Far West," have 39,686,580 inhabitants, or 2,000,000 less than two-thirds of the population of the Union. The Southern States, together with the border States of Tennessee and Kentucky, are grouped as the South Atlantic and Southern Central divisions, having, respectively, 8,836,759 and 10,948,253. The Western division, which takes in the States of the Pacific coast, the newest States and the southwestern territories, makes up the balance. Of the increase of 12,324,757 in the decade, the largest gain was that of the Northern Central division, 4,958,040, of which almost one-half is to be credited to Ohio, Illinois, Missouri and Nebraska. The census has come in for a great deal of criticism, but so did the two preceding censuses. That the enumeration has been taken carelessly in spots, that it does not carry with it the conviction of accuracy in all localities, is, we fear, not open to question. If an investigation shall be made, it will probably be found that the defects of the census are attributable to clumsy methods rather than to design. It is incredible that any conspiracy to defraud any party or section of its political dues should have been organized. The secret would have to be confided to thousands, every one of whom would make more by selling it than keeping it.

THE WEATHER BUREAU.

The last session of Congress passed an act to increase the efficiency of the Signal Corps and to transfer the weather service to the Department of Agriculture. The act provides that the civilian duties now performed by the Signal Corps of the army shall devolve upon a bureau to be known as the Weather Bureau, which on and after July 1, 1891, shall be established in and attached to the Department of Agriculture, and that the Signal Corps of the army shall remain a part of the military establishment under the direction of the Secretary of War. The Chief Signal Officer is to have charge, under direction of the Secretary of War, of all military signal duties and of all devices connected therewith, including telegraph and telephone apparatus and the necessary meteorological instruments for military uses. The act provides that the Weather Bureau shall consist of one Chief of Weather Bureau, who, under the direction of the Secretary of Agriculture, is to have charge of all duties pertaining to the weather service, and such civilian employes as Congress may annually provide for and as may be necessary to perform the duties of the Bureau. And it is further provided that the Chief Signal Officer of the army may, in the discretion of the President, be detailed to take charge of the Weather Bureau, and that other officers of the army, not exceeding four, expert in the duties of the weather service, may in like manner be assigned to duty with the Weather Bureau. It is thought that the services of these army officers expert in weather service may be required, pending the training of civilian experts in forecasting.

HYPNOTISM IN RUSSIA.

The impropriety of permitting public exhibitions of hypnotic manifestations has been frequently urged in these columns. The pernicious possibilities of such performances are neatly summed up in a circular issued in August last by the Government Medical Department of Russia, which declares: "In consideration that public exhibitions of hypnotism cause considerable injury to the health of subjects experimented upon as well as of spectators witnessing the experiments, the performances being apt to give rise to the development in hypnotized persons of various hysterical, nervous, and even mental affections, which may sometimes amount to a genuine epidemic of hypnotic mania; that such public hypnotic entertainments offer to evil-minded persons a good opportunity for studying methods of hypnotizing, and for subsequently practicing them for various immoral or criminal purposes; that generally such hypnotic performances, being not accompanied by any rational explanation, can breed in the public only erroneous notions and even implant superstition, while post-hypnotic suggestions can constitute a source of disturbance of order and the peace of the community by hypnotized persons, and even of committing criminal deeds by the same, the Medical Council has resolved: That henceforward any public seances of hypnotism and magnetism are strictly prohibited; and that the application of hypnotism for medical purposes can be permitted solely to medical practitioners, under the condition that the operation is to be practiced invariably in the presence of other medical men."

TRANSATLANTIC TELEGRAPHS.

There are but three ocean telegraph cables running into New York city, and these have only been laid within very recent years, two of them little more than a year ago. Before these were constructed the ocean cables only reached to Nova Scotia and Newfoundland, and messages for Europe were sent from New York to those points by land lines. On this account interruptions to communication with Europe were frequent. It is now very rare that any difficulty in that way is experienced with cables. All three of the cables entering New York city are duplexed, which practically makes six cables available for work. They are laid under the ocean from Cape Canso, Nova Scotia, and first emerge from it at Coney Island landing at a secluded spot on the beach. From thence they are laid in subways to the Brooklyn Bridge. They cross the East River by the bridge, lying, three thick, rope-like, cloth-covered wires, among the many that cross the big bridge on the iron work beneath the promenade. The bridge is the route all messages take from this country to any part of the world outside of this continent. The manner in which messages are sent and received over the transatlantic cables between this country and Europe is very different from that in which telegrams are transmitted across

the continent on land lines. The two systems of submarine and overland telegraphy, although but two departments of the one science, and in many ways closely connected, are yet entirely different one from the other. The apparatus, the methods of signalling, and even the telegraphic characters that form the alphabet, are altogether dissimilar, and the most expert land-line operator would be as much at a loss in an attempt to send a message over the cable as would a locomotive engineer. Instead of the loud clatter and din, and the incessant clicking of brass sounders, so familiar as the distinctive characteristic of a telegraph office, there is in the cable office almost absolute silence, so far as the manipulation of the instruments is considered. Instead of the messages being rattled noisily off the tongue of a brass sounder into the ear of the operator, they are silently written by a slender, mysterious finger on a ribbon of white paper, which passes quickly before the operator's eyes. The paper ribbon, about half an inch wide, is unwound from a roll and drawn along by noiseless clockwork over a shelf-like desk in front of the operator. A delicate glass tube, no thicker than an ordinary needle and crooked like a bent forefinger, which is suspended between the poles of a large upright magnet, moves nervously to the right and left on the ribbon and traces in a thin line of blue ink the characters.

TIME—LOCAL AND SIDERIAL.

HOW THE ARRIVAL OF NOON IS ASCERTAINED AND ANNOUNCED.

According to the Washington correspondent of the *Boston Transcript* one million dollars' worth of time is sold by the Western Union Telegraph Company every year. It enjoys what is practically a monopoly in the marketing of this commodity in the United States, and a vigorous protest against it has been addressed to the Government. The kick is made in concert by private astronomical observatories all over the country, which complain that such business as they would otherwise do in the selling of time is destroyed by that great corporation. To make all this clear, it is necessary to explain that the big Naval Observatory at Washington considers it an important part of its business to determine and give away to any one who may choose to ask for its absolutely correct time at noon each day. Experts paid by Uncle Sam make the computations and press the button at precisely twelve o'clock, thus communicating the hour to the various departments in this city. The Western Union is permitted to have its instruments in the room whence the message is sent, with an attachment to the button, so that the news is flashed directly from the observatory, without even the aid of an operator, all over the United States, reaching even so distant a point as San Francisco within the space of not more than one-fifth of a second. For such is the utmost twinkling required for the passage of an electric spark through three thousand miles of wire. To accomplish this the telegraph company is obliged to take all other business off the wires each day just before twelve o'clock. Three minutes and a half before noon arrives, operators in all parts of the country cease sending or receiving messages and devote their attention to attaching wires in such a manner as to establish unbroken connections from Washington with points in every section of the Union to which the lines extend their ramifications. A dozen seconds before the time-bell is to strike, a few warning ticks come flashing along, and at the very moment when the sun passes over the seventy-fifth meridian a current gives a single throb from Maine to Florida and from the Atlantic to the Pacific, informing an expectant nation of the time of day. Of course, there is a difference of three hours between Washington and San Francisco, but that difficulty is got over by dividing the whole country into four perpendicular strips, each strip setting its clock by the time of the meridian that bisects it from north to south. Thus each strip is always one hour later than the next strip to the east. When you get to Chicago you put the hands of your watch one hour back; having reached Omaha you set them another hour rearward, and, upon arriving at San Francisco, you find yourself still one hour in advance. In this way the noon signals sent out from Washington serve to indicate 11 A. M. for Chicago, 10 A. M. for Omaha, and 9 A. M. for San Francisco. Now, the way in which the telegraph company makes money by distributing the time in this manner is by selling it to people all over the United States who have clocks and find it of importance to keep them right. In this manner it keeps corrected by electricity to absolute solar time no less than seven thousand clocks in the city of New York alone. Each clock is charged for this service $15 a year, which makes an income of $105,000 so derived from the metropolis only. Doubtless quite $1,000,000 annually is obtained from the setting of clocks once in a day in the populated centres small and large of the Union. All that the company is obliged to pay for the time which sells for such a yearly sum is the cost of maintaining its instruments at the observatory and the wires connecting these instruments with the main office in Washington. But it must be remembered that the cost of stopping telegraphic operations for four minutes in the busiest part of each day throughout the entire country is not inconsiderable. Nevertheless, the profit is sufficiently great to excite the indignation of the private observatories, which wish to sell time themselves, against the Western Union. They contend that, although they are able to make and deliver an equally good and accurate quality of time themselves, the prestige naturally attaching to Government time drives their product out of the market and ruins the local trade they might otherwise find profit in. Who is going to buy time of them when the same commodity is to be purchased at a cheap rate from the National Astronomer? In response to their protest, addressed to the Secretary of the Navy, the latter has replied that any one is welcome to share the same privileges enjoyed by the Western Union Company in the getting of time free of charge; the Postal Telegraph, for example, is welcome to put its own instruments in and flash the message of the button whithersoever it listeth. As things stand at present, the Government is glad to extend in any fashion the courtesies of the hour to sixty million people, and more particularly to secure the accurate dropping of the noon time-balls in all the important seaports, in order that mariners may be able to correct their chronometers. This last was from the start the prime object of the service. So far as the expense of obtaining perfectly accurate time is concerned, the Western Union or any other concern could establish and run an effective plant at a first cost of $5,000 and $2,000 a year. The clocks that are set every noon in a thousand cities and towns by a single pressure of the button in Washington are equipped with a peculiar electric contrivance, so that the current passing through them springs the hands of each timepiece simultaneously to the point of twelve. The observatory does not reckon its time by the sun, but by the so-called "fixed" stars, which are so far off that their position with relation to the earth does not change appreciably within a few months or years. Star time is the only true time, therefore. The operator looks through a big telescope and watches for a given star that he knows to cross the plane of the meridian. As it crosses, he records what moment it does so as shown by a star-time clock with a twenty-four-hour dial. Then he consults a printed table that shows him at just what number of hours, minutes and seconds the star in question must actually have crossed the meridian plane. The table is right, and by as much as the star-time clock differs from it the latter is wrong. No attempt is made to set the star clock right, allowance being simply made in subsequent calculations for the error thus discovered, which amounts only to a fraction of a second in some days. Next the corrected time, as taken from the star clock, is reduced to sun time, which requires some figuring, inasmuch as the star year is one day longer than the sun year. A sun time or "standard" time clock stands close by, and, the amount that this varies from the truth having been ascertained, allowance is made for the error in sending the noon stroke all over the country. At the observatory all the chronometers made for the navy are tested and regulated before they are sent out on vessels, each one of which is supplied with three first-class chronometers, as well as one half used up, called a "hack," for carrying about and for rough service generally. It takes twenty-one weeks of testing to properly regulate and prove a chronometer, and part of the trial consists in subjecting the instrument to the action of cold in an ice-box, and to heat communicated through steam-pipes. Each chronometer, when given out, is accompanied by a chart telling just how it will vary under certain temperatures. A curious exhibit now shown at the observatory includes eight chrnoometers that went down in the great gale that swamped a fair part of Uncle Sam's navy at Samoa. Their glasses are broken and their works so far used up that they are no longer any good.

MIRRORS.

DESCRIPTION OF A CHICAGO FACTORY.

One of the factories in Chicago employs some one hundred and fifty men and boys, and its spacious four floors present an interesting series of sights to the visitors whose nerves are steel and tympans proof against splitting. On the first floor he will see huge stacks and piles of glass in assorted sizes, from sixteen feet by seven feet squares down to the smallest ovals for mirrors. These are all polished, some being run over huge felt-covered wheels kept powdered with rouge, and the larger sheets scrubbed by sweating toilers with hand blocks covered with felt like a printer's proof planer in rouge. After the glass is thoroughly polished it is taken up to the next floor, where it is laid on tables and cut into the sizes ordered. It then passes into the hands of the beveller, who, with sand and water and large grindstones, artistically finishes the edges of the glass. It takes a trip upward again to another floor, and is once more put through a polishing process to remove any scratches or blemishes that may be on the glass. After every spot or scratch, no matter how minute, has been removed, careful hands convey the now beautiful and sparkling glass to the room where it goes through the final process, the silvering. Huge tables of cast iron or stone, made like billiard tables, with raised edges, are used in the silvering room. These tables are of great strength and solidity, and all around the edge is a drain, for the superfluous mercury is poured over the tables in quantities sufficient to float

the glass, which, after being tinfoiled, is gently and carefully pushed across the table containing the mercury. Great care must be used to prevent blemishes, the least speck of dust being ruinous to the mirror. Mercury, like molten lead, is always covered with a dirty-looking scum, which cannot be removed by skimming. The least bit of this scum would spoil the mirror, so the difficulty is obviated by shoving the scum along with the edge of the glass. After successfully floating the glass on the mercury, a woolen cloth is spread over the whole surface, and square iron weights are applied until the whole presents a compact mass of iron, two or three pounds to the square inch. After this pressure has been confined ten or twelve hours, the weights are removed and the glass placed upon another table of wood with a slightly inclined top. The inclination is gradually increased until the unamalgamated quicksilver has drained away, and only the perfect amalgam remains, coating the glass and perfectly adhering. This ends the process, and the erstwhile rough piece of plate glass emerges from the silvering room a gorgeous mirror.—*Western Manufacturer.*

THE OPAL.

HOW THE GEM BECAME ASSOCIATED WITH THE EVIL EYE.

In the early days of the world's history the opal was prized above all other gems, and was looked upon as the embodiment of all that was lucky. A Roman dame prized none of her possessions so highly as her opals, and fortunate indeed did she consider herself if she happened to be the owner of a more than ordinarily beautiful specimen. The fair fame of the opal remained untarnished throughout the middle ages; and two or three hundred years ago our ancestors showed a fondfor this beautiful stone which rivalled that displayed for it by the Romans. But by a strange freak of fashion the opal was brought down from its high estate. It is becoming popular again now; but in the earlier days of the century it was almost valueless, so great was the discredit which superstitious people had cast upon it. This dislike to the opal has been attributed to the Russians, for the stone is so unpopular among the subjects of the Czar that should one of them happen to descry an opal, nothing will induce him or her to make any purchases that day. There is a universal belief among them that every kind of bad luck is sure to follow transactions entered into on a day upon which an opal has been brought before their notice. The reason for this antipathy is that Russians regard this gem as the embodiment of the "evil eye." Sir Walter Scott must to a certain extent be made responsible for the bad odor in which the opal has found itself of late years. In "Anne of Geirstein" he alludes to the belief that the Mexican opal loses its beauty when exposed to the action of water, and puts this down to supernatural agency. Hence arose the idea that to wear an opal is the royal road to all manner of ill-luck, and that as a love token the stone shows the continuance or decline of the giver's affections in proportion as its colors are bright or clouded. Whenever its hues suddenly changed, misfortune of some kind or another was believed to be close at hand. The unpopularity of the opal is, however, capable of being explained in a more prosaic manner. It is a well-known fact that the stone in an opal ring is very apt to be lost in an unaccountable and mysterious fashion. This arises from the fact that the opal possesses the characteristic of becoming slightly enlarged under the influence of heat. When, therefore, its owner's hand gets hot, it is liable to swell and force its setting open to a certain extent. When it grows cold again, the gem returns to its original size. This process is repeated until the setting becomes sufficiently enlarged to allow the stone to drop out unnoticed. Another equally practical reason for the ill-favor with which opals are regarded is that they are very easily broken, and cannot therefore be looked upon as safe investments. The most magnificent opal in existence is one which was unearthed in the Hungarian mines a hundred and twenty years ago. It was acquired by the Austrian Government, and now rests in the Imperial cabinet at Vienna. An offer of sixty thousand pounds made for it by a jeweler was refused. This splendid stone weighs seventeen ounces; it is nearly four inches in length, and is indescribably lovely in coloring. If ancient records are to be believed, it is, however, by no means the most valuable opal that has ever been discovered. A Roman senator, Nonius by name, is said to have worn in his ring one, which, though no bigger than a hazel nut, was of such surpassing brilliancy that its worth was estimated at various sums from a hundred thousand pounds to a quarter of a million. When Cleopatra pledged the enamored Antony in a draught of vinegar in which tradition says that she had dissolved a pearl of fabulous worth, the enslaved triumvir endeavored to obtain possession of Nonius' opal in order that he might present it to the beautiful Egyptian. But the senator was too fond of his splendid jewel to be induced to part with it, and so sought refuge in flight, recognizing the fact that his master, having failed to obtain the gem he coveted by fair means, would have no hesitation in resorting to foul. In vain did Antony try to find him. He concealed himself and his precious opal so successfully that the latter has never been seen or heard of since. Arabia and Syria are said to have been the countries from which the ancients obtained their opals. They are, however, no longer renowned for this particular gem. Common varieties of the opal are found in many parts of the world; but the precious or noble opal is mined almost exclusively in Hungary and Honduras. The Hungarian opals are the finest in the world. Those which come from Honduras are less milky, and are also somewhat deficient in that fiery lustre which is so striking a characteristic of the best stones.

A TERRIBLE ORDEAL.

HOW THE SECRET SOCIETIES OF EUROPE TEST THEIR NEOPHYTES.

An officer of the French army, during the reign of Napoleon, having incurred the suspicion or resentment of the emperor, thought it expedient to take refuge in one of the Austrian provinces, and here he became initiated into a society the object of whose formation was to assassinate Napoleon. One day a letter was brought to him containing the usual signs and passwords of the society, and requiring him to repair, on the following night, to a secluded spot in the forest, where he would meet some of his associates. He went, but he found nobody. The orders were repeated four times. The officer sought the appointed place with no better success than the first. On the fifth night of his appearance at the rendezvous, after waiting some time, he was on the point of returning when loud cries suddenly arrested his attention. Drawing his sword, he hastened to the spot whence they proceeded, and was fired upon by three men, who, on seeing that he remained unwounded, instantly took to flight, but at his feet lay a bleeding corpse. He was yet bending over the dead man when a detachment of chasseurs, summoned apparently by the noise of the pistols, came up suddenly and arrested him as the assassin. He was loaded with chains, tried the next day, and condemned to die. His execution was ordered to take place at midnight. Surrounded by the ministers of justice, he was led at a slow pace, by the light of torches and the funeral tolling of bells, to a square, in the centre of which was a scaffold environed by horsemen. Beyond these were a group of spectators. The victim mounted the scaffold, and his sentence was read, and the first act of the tragedy was on the point of fulfilment, when an officer let fall a word of hope. An edict had just been promulgated by the Government offering a pardon and life to any condemned criminal who should disclose the members and secret tokens of a particular association of which the Frenchman to whom these words were addressed had lately become a member. He was questioned, but he denied all knowledge. They urged him to confess, with promises of additional reward. His only reply was a demand for immediate death—and his initiation was completed. All that passed was a terrible trial of fidelity. Those who surrounded him were members of the society, and every incident that has been described was only a step in the progress of the fearful ordeal by which the society sought to determine the trustworthiness of the neophyte.—*Ledger.*

SLENDER CHANCES.—It is only one person among a thousand who becomes a centenarian, and hardly six persons among a thousand who attain seventy-five years of age.

RARE AND COSTLY.—The most valuable metal in the world is said to be gallium, which is worth $3,250 an ounce. Calcium brings $1,800 a pound, and corium $1,920 per pound. Gold is worth $240 a pound.

BRITISH GRIP.—The cost to England of the influenza epidemic is estimated at $10,000,000, about one-half this amount having been paid by insurance companies and friendly societies, and the remainder representing loss of wages and disorganization of business.

POTATO PAINT.—A recent novelty is the production of paint from potatoes in France. A kilo of peeled potatoes are boiled in water, mashed, diluted with water, and passed through a fine sieve. On adding two kilos of Spanish white with four kilos of water, the result is a color of beautiful white. Different colors may be produced by adding the various ochres of minerals.

ELECTRIC DISCOLORATION.—Incandescent lamps placed near the ceiling will cause it to blacken, contrary to general belief. The blackening is due to a current of hot air which deposits black particles on contact with a cold surface.

DEODORIZER.—A pleasant household deodorizer is made by pouring spirits of lavender over lumps of bicarbonate of ammonia.

HERB CURE.—The Russian government has dispatched several doctors to Asia Minor to test, by experiment, the treatment of cholera with the Feruba Sambul—a plant which grows in Turkestan, and possesses anti-spasmodic properties.

BERLIN BEEF.—It is stated that, in compliance with the public wish, a horsemeat restaurant has been established at Berlin, wherein a large trade is carried on.

VERY LIKELY.—Rev. James W. Ford, who has spent nearly all his life as a missionary to China, says he has studied Chinese for 50 years and yet has not mastered the language. Any man who has ever tried to get his shirt without the check will readily believe this.

COMFORTABLE CIRCUMSTANCES.—The richest man in the world, if he lives to inherit his patrimony, will be the young Viscount Belgrave, grandson of the Duke of Westminster. By the time he attains his majority it is estimated that his income will be between $10,000 and $20,000 a day.

A DEAD SEA.—Black Sea soundings are said to show that below the depth of 600 feet the water is so impregnated with sulpurated hydrogen gas emanating from decaying animal and vegetable matter that living organisms are not found there.

ROUGH ON RATS.—An illuminated cat is among the curiosities of the Patent Office at Washington. D. C. It is made of pasteboard or tin painted over with phosphorus, and it is intended to frighten away "rats and mice and such small deer," in the darkness of cellars and garrets.

ALLEGED DISCOVERY.—Dr. Spamer, the teacher of botany at the gymnasium in Duren, claims to have found the identical herb which the monks of Grenoble use in distilling "Yellow Chartreuse." The doctor says it is growing wild in the neighborhood of the ruins of the old monastery of Schwarzenbroich, near Duren, which formerly belonged to the monks of Grenoble.

A VAST LIBRARY.

THE ENORMOUS COLLECTION OF THE BRITISH MUSEUM.

The British Museum Library is the student's paradise. It has every modern convenience of light, heat, and service. The main room is a huge, bright rotunda, with walls covered with standard works, a great expanse of skylight in the ceiling, and a thick rubber matting on the floor, to render noiseless every movement of the little army of scholars, attendants, and visitors who daily travel through its myriad passageways. Porters, cataloguers and assistant librarians, trained by long years of service, observe and fill every want of the patrons as soon as it is manifested, yet so skilfully, swiftly and unostentatiously that confusion is unknown and mistakes almost unheard of. To the man accustomed to the inconveniences and practical unreliability of the ordinary American library the operations and system in the British Museum seem perfect. The student need not rummage about for himself till his straining eyes bulge and his throat is choked with dust. He need not climb shaky step-ladders and hug dirty book-shelves till his clothes reek of mustiness and look like an ash-man's. He need not even follow compound book titles through huge catalogues and complicated systems of arrangement. All this wearying of the flesh that in a New York library consumes the student's energy before he sees even the outside of the volumes he desires, is done for him in the British Museum, so that his whole energy and uninterrupted attention may be concentrated on mental labor. The simplicity of the whole system of facilitating the work of students is so admirably calculated to invite and encourage scholarly research, that it is worth a slightly detailed description for the comfort of New Yorkers who, after having exhausted themselves in vain searches for special information in city libraries, have left humbly with the conviction that they were not up to the library standard of erudition, and must therefore resign library advantages to the higher powers of professional bookworms. To get a reader's card to the British Museum Library a person needs only to be guaranteed by some Londoner whose name is in the directory. A day or so after this guarantee has been given the applicant calls at the secretary's office in the museum building, receives his card, presents it to the doorkeeper of the library and is admitted. Nobody without a card can pass into the rotunda. The stringent enforcement of this rule enables the directors of the library to keep the big room clear of the multitudes of visitors to the outside museum, and quiet for readers. Within the reader finds long rows of desks and big leather-backed chairs, radiating from a double line of circular book-shelves, full of catalogues, at the centre of the room. In a little circular desk at the very middle, completely surrounded by catalogues, reference cards, and volumes that tell everything about everything in the place, is the commander-in-chief—either the head librarian or his assistant. If the reader be entirely new to the subject he wishes to study, he goes directly to this man at the middle desk and describes the line of research he wishes to pursue. The line of research may be medical, or metaphysical, or geological, or geographical, or ornithological, or economical, yet the man at the middle desk is always able to give the names of eight or nine special works with which the student may make a start. An attendant is called, the titles are given to him, he hurries through the catalogues under the supervision of the reader, and having found the location of each volume, hurries off for the whole lot. The reader makes himself comfortable at an unoccupied desk provided with pens, ink, blotters, and book blanks. In ten minutes his books are laid on the desk. As he digs down into them he begins to appreciate the paradise he has fallen in. Whenever he finds a foot-note reference to other books on the subject he is investigating, he is not obliged to hurry off on a wild goose chase up and down stairs, through dust and dirt, and draughts and dark passages, after the desired works; he need not even go to the librarian's desk; he has simply to indicate on one of the book blanks before him the volume or volumes he wishes, shove the blank into a little basket, and within ten minutes every volume is on his desk. An attendant whose business it is to watch baskets, saw the slip fall, picked it out immediately, hastened off for the books, brought them without an instant's unnecessary delay, and there they are. Without a spoken word, a wasted minute, or a useless step, the reader may push on from one stage of his work to the next. All contingencies seem to have been provided against by the management of the library. The familiar "In use" of New York libraries is never heard there. Of every work of any popularity or fairly general need there are duplicate copies beyond all possibility of exhaustion. No embarrassment or delay is caused by orders for many books at once or especially big ones. The attendant merely takes a little cart with rubber tires on the wheels with him to the remote recesses where most of the books lie, and trundles back his load as promptly as if he had been filling an order for only one volume. In this way big Congressional documents, Parliamentary reports, huge census compilations, and German histories are handled as easily and delivered as promptly as a Cobden Club tract or the lightest novel. Little idea of the inexhaustible variety of the books in the British Museum Library is conveyed by the statement that it contains 1,200,000 on 1,300,000 volumes. The figures are staggering, but not so staggering as the minute completeness of the literature on an infinite number of subjects. The sources of original information on subjects old and new, foreign and English, great and small, are ample beyond the conception of the student who has not had an opportunity to draw from them. Files of newspapers of all civilized countries, contemporary literature up to the last few days, foreign pamphlets and tracts, even to the most ephemeral, allow the painstaking investigator to drink at the mainsprings of information of all topics of all lands. An illustration of the cosmopolitan comprehensiveness of the library may be had in the abundance of the material on such an entirely foreign subject as paper money in the United States. The literature on this topic reaches back to the beginning. American newspapers, one hundred, one hundred and twenty, and one hundred and thirty years old, are obtainable at a few minutes' notice. Piles of antiquated eighteenth century pamphlets of cisatlantic publication, with f's for s's and ye's for the's, and ponderous explanatory titles, full of arguments for and against revolutionary and ante-revolutionary paper, are stowed away in the innumerable alcoves of inner rooms. Polemical writings on ths finest questions of the relations of bills of credit to the provisions of the Constitution may he got for reference with only a little delay beyond the usual ten minutes allowed for delivery. With the growing dates the comprehensiveness of the materials increases, till for 1808–12 the mass is overpowering; for 1833–39, unmanageable, and for the days of the last war a whole large library by itself. Few exhaustive works of recent date concerning the ancient history of paper money in this country are without unmistakable traces of the authors' direct or indirect use of the British Museum Library. A student who has worked there and in all the New York libraries said recently: "In the London library I can learn more about American financial history in a day than I can learn in New York in a week. I can get at more original sources of information there as to our colonial days than it would be possible for me to collect from all the libraries of New York, public and private combined, and that, too, without greater exertion than is required to sit at a desk and write titles on slips of paper. To make even an attempt at accomplishing an equal amount in New York, I would be obliged to run from Lafayette Place to Harlem, to plough my way through acres of catalogues, and climb miles of stairways, step-ladders, and musty shelves. If New York wishes to offer American students any such encouragement for looking into their country's history as is offered by the Baitish library, it must consolidate and complete with the aid of historical experts its small, half-private libraries, get a practical and popular system of cataloguing, and hire sufficient attendants to do all the physical labor of reference work." The remarkable conveniences of the British Museum Library have made it a resort for all literary students. Its three hundred and odd desks are always occupied, and its inexhaustible mines of accessible information are being constantly worked. Great men have sat at nearly every desk. Thomas Carlyle has hewn out his ragged-edged sentences within its precincts. The gaunt form and earnest face of Lecky have passed through its aisles. Gladstone has added to his mighty store of learning from its treasury of knowledge. Disraeli has turned its abstruse pages, and Cobden and Bright have pilfered within its walls the facts they were so brilliant in popularizing. To-day scholars and newspaper reporters, magazine writers and agents for information bureaus, sit side by side at its desks. The round-faced girl with the bobbed hair and the round waist grubs deep in an encyclopedia within reach of the bald old man in a sea of classic literature. The *Nineteenth Century* editor, the *Star* critic, and the omnivorous novel reader push along, quite oblivious to each other, within a space of a few feet. Every one meets every one within the rotunda's great circle, with its radii of desks, and every one learns there everything he came to learn with all possible speed and the minimum of exertion. Thus day by day, month by month, year by year, and decade by decade this great silent educator of the people continues at work, compared with which the more pretentious work of the English universities is insignificant and unproductive.

GHOSTS.

THEIR GENUINENESS ACCEPTED BUT NOT UNDERSTOOD BY SHAKSPEARE.

We cannot doubt that Shakspeare, like his contemporaries, believed in ghosts, while we do not. How, then, can we say that he is true to nature, when he makes Hamlet or Brutus or Macbeth see ghosts, talk with them, and thereby in all respects believe in them. Skeptical arguments against the reality of ghosts were not unknown to Shakspeare's contemporaries. He must have read them himself in Plutarch's "Brutus," but we cannot suppose that those arguments had more effect on him than on Brutus himself. And we cannot escape from the difficulty by saying that the superstition being natural to the poet and to the men of his time, it was natural that he should make the personages of his plays subject to it. For the groundwork of all our study of Shakspeare assumes that he was not merely of an age, but for all time. What we do say is that the men of Shakspeare's age believed in ghosts because they had seen them, and we for the same reason disbelieve in them. We have, like Coleridge, seen too many. Plenty of ghosts have been and still are seen, but the sight has been verified by investigators with habits of mind derived from the practice of the Baconian method of examining facts. Ghosts have been verified, and like many other phenomena once so mysterious as to be supposed to be of supernatural or preternatural origin, they have been found to have their place under known laws of nature. They have been ascertained to be, in metaphysical phrase, subjectively but not objectively real. They come not under the laws of the bodily eyes and of optics, but under those of the imagination; and it is imagination which can and does give the brain most of the impressions of bodily sight and sound when a ghost is seen. We say most of these, because among the distinctions between a real and a sham—that is, a pretended, dressed-up—ghost is this, that the real ghost does not strike such terror as does the sham, nor does it tell his hearers what he did not know before. It is true that in many well-authenticated ghost stories, of our own time even, there is an element of unexplained coincidence which still seems to give them a super-

natural appearance; but these, too, the friends of "Psychical Research" believe that they shall one day bring under ordinary natural law.—*The Quarterly Review.*

THE AMERICAN INSTITUTE FAIR.

This annual exhibition must naturally have a great deal of sameness from year to year. The only new features to be expected are those of exhibitors who have not attended previous exhibitions. Otherwise we have the same familiar music, flowers, fruits, steam-engines, ore-crushers, dynamos, wood-working machines, elevators, cook-stoves, prepared flour and folding beds, each attendant trying to load the visitor down with circulars and samples and nearly every visitor crowding around those stands where free samples of batter cake, ice-cream, chocolate and beef-tea are given away. Among the novel exhibits this year may be mentioned the Economy Ice-cream Freezers, a southern invention, the ice and salt being placed in a cylinder which is revolved in a trough containing the cream to be frozen and forming the frozen cream in a layer of perhaps two inches thick around the outside. Another very ingenious exhibit is the McMaster Camping Car, designed for tourists and sportsmen. This is about the size of an ordinary omnibus and is provided with water tanks, closet, wash-bowl, ice chest, wardrobe, table, drawers, kitchen, dishes, knives, forks, plates, oil stoves, etc. It seats ten, and has sleeping accommodations for six people. The whole establishment weighs twelve hundred pounds and can readily be drawn by two horses. The Paconic Marble Co. exhibits some of the most beautiful variegated and blue marbles quarried at Manchester, Vermont. Armour & Co. have a fine exhibit of their Beef Extract and are particularly jubilant over their well deserved success in having obtained the order for beef extract from the U. S. Army Medical Department over all competitors. The Cleveland Baking Powder Company is making a splendid show with their baking powder this year and are distributing some very telling literature. The Doliber Goodale Company have an attractive exhibit of their Mellins Food for Infants and Invalids. Among the pianos on exhibition there are none making a better appearance and attracting more attention for fine brilliant tones than the "Opera" of Messrs. Peek & Son.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

November.

MEATS.—Beef, mutton, pork, venison.

POULTRY AND GAME.—Chicken, duck, geese, grouse, hare, partridge, pheasant, pigeons, rabbits, turkeys, widgeon, wild ducks, woodcock.

FISH.—Brill, carp, cod, whiting, salmon trout, perch, smelts, oysters.

VEGETABLES.—Artichokes, broccoli, celery, potatoes, turnips, cauliflower, cabbage, carrots.

FRUIT.—Apples, pears, quinces, grapes, nuts.

PRACTICAL RECIPES.

CHESTNUT SOUP.—Make a good broth of lean beef, mutton or venison, allowing one quart water to every pound of meat; season with red pepper and salt. Skim as it cooks and when the meat drops from the bones strain, and put the liquor in a clean kettle; add to the soup a little more than a quart of chestnuts boiled and peeled; add also some bits of butter rolled in flour; boil for ten minutes and serve.

CHICKEN PIE.—Select a nice tender chicken, weighing about three pounds, joint it and simmer in about two cups of water till the meat is ready to slip from the bones. Carefully remove, it taking out every particle of gristle. Line a baking-dish with good paste and put in a layer of the chicken, season with salt and pepper, then add a layer of hard crackers soaked for a moment in milk, another of chicken, seasonings, and so on, till the dish is filled. Heat the chicken gravy and add to it a cup of cream in which a teaspoonful and a half of flour is well mixed. Beat light one egg and add it lightly to the gravy; after it has been boiling a few moments, season and boil up once, then pour it over the chicken. Cover the pie with paste and bake in a good hot oven.

DUTCH CAKE.—From your bread dough take out about two pounds and add to it a cup of sugar, three large tablespoonfuls of butter and two well beaten eggs, knead thoroughly using extra flour if necessary to prevent sticking; when the dough is smooth and soft work in a cupful of seeded raisins; mould into loaves, set to rise, and bake as you would bread.

GRAHAM GEMS.—Beat separately the yolks and whites of three eggs and to the yolks add one pint of milk, one teaspoonful of salt and one and a half pints of Graham flour in which two teaspoonfuls of baking powder have been sifted. Beat until smooth; add a tablespoonful of melted butter and the whites; mix well and bake in gem pans for about half an hour.

MRS. S.'S SOUTH KENSINGTON PUFF PASTE.—Six ounces butter, eight ounces flour, a little salt and a squeeze of lemon juice; a little ice water. Chop the butter into the flour, put it into a bowl, make a hole in the centre, put in the lemon, salt, water, and yolk of one egg; make a stiff paste, roll four times, folding together and always turning the rough edges toward you after each rolling. Put it on the ice for five or ten minutes before baking.

MRS S.'S PUFF PASTE WITH LARD.—Eight ounces flour, four ounces butter, two ounces lard. White of one egg beaten in yolk. A squeeze of lemon, a little salt and cold water. Roll four times very thin. To glaze pastry paint either with yolk or white of an egg.

MRS. S.'S MACAROONS.—Whites of three eggs, half a pound of almond paste, three-quarter pound of powdered sugar. White beaten to a stiff froth; add nearly all the sugar and nearly all the paste. Bake one and see if it is stiff enough, if not add the rest. Sprinkle almonds chopped fine on the top and then sprinkle again with powdered sugar. Cut stiff paper to fit pans. Grease the paper well and bake in a slow oven. Drop on the paper enough to make the size you wish.

ADULTERATION IN ENGLAND.

A WELL-SANDED MIXTURE AT $25 PER TON.

A remarkable case of pepper adulteration has come under notice. A firm of chemical manure manufacturers wrote to a well-known wholesale house in London, offering them any quantity up to forty tons of "good ground brown pepper" at £5 per ton. The circumstances of the case—especially having regard to the fact that the market price of Batavia or Penang black or whole pepper is about £50 a ton—appeared so suspicious that the wholesale house forwarded a sample of the "pepper" to an analyst, who has supplied the following certificate: I have analyzed the sample of "pepper" and it is unmistakably adulterated. It contains 10 per cent. of sand, and only 1.76 per cent. of piperine. This last result would correspond with not more than 20 per cent. of real pepper contained in the sample. The adulterant is of a very fibrous character, but I have not as yet been able to ascertain precisely of what it consists. The wholesale house who received the sample of "pepper" wrote, at our desire, to the firm who offered it, asking the lowest price they could charge for five or ten tons. In response to this letter they were honored by a visit from the firm in question, who stated that they might be induced to take somewhat less than £5 per ton, although they had already sold five tons in London at higher prices, reaching as much for some portions as 10s. per cwt. They further stated that they had landed the parcel for some firm, whose name they did not mention, but they could give no guarantee. They added that the bulk of the article had been sold on the continent.—*Can. Jour. Com.*

AN ADMIRABLE CYCLOPEDIA.

We are glad to note the appearance of Vol. XXV. of Alden's Manifold Cyclopedia, a most admirable work, now rapidly approaching completion. Among the countries, States and cities we find treated in this volume are: Montenegro, Montreal, Moravia, Moscow, Morocco. Munich, Muscat, Naples, Nashville, Nassau, Nebraska, Netherlands. In the line of biography we have Montesquieu; Montgomery, the poet; Moody, the evangelist, with an account of the Northfield Seminary and the Mount Hermon School for Boys; Sir John Moore; Hannah More; Sir Thomas More, author of Utopia; Moreau and Murat, the great generals; Gouverneur Morris and Robert Morris; Oliver P. Morton, Indiana's great war Governor; John Lothrop Motley, the historian; Valentine Mott; Murillo, the painter; Lindley Murray; Nansen, the explorer; Napoleon Bonaparte; Neander, the Church historian; Nelson, the admiral; and many other eminent men. Among the hundreds of topics coming under the head of general information, we notice: Moon; Mormons, 13 pages; Mortality, Law of, with useful tables; Motion, 6 pages; Movement Cure; Music, about 18 pages; Mythology; Nationalism; Navies, a valuable article; Negro; Neo-Platonism; Nervous Diseases; Nervous System, 16 pages; and Neuralgia. The whole field of human knowledge is comprehensively covered, the subjects have been well brought down to date, and there are numerous illustrations. One of the best things about this magnificent work is the fact that the prices are extremely low, and the publishers are offering such wonderfully easy installment terms as to bring it within the reach of every one.

ON GENERAL DEBILITY.

Just as "charity covers a multitude of sins," so the phrase "general debility" is used to cover an almost unlimited number of ailments. While of course its common meaning of physical weakness, malaise or inability to work either mentally or bodily, justifies to a considerable extent its universal use, yet the entire ignoring which underlie the complaints it represents and even of the special symptoms which characterize each case, stamps the expression as unscientific, if not as incorrect. It is hard to fight against an established usage and as the phrase is everywhere in vogue and conveys a definite idea to the minds of most readers a few common-sense words upon debility may be of interest and value. The human body is a machine,—probably the most perfect mechanism which the world has ever seen. Its normal condition is health, strength, and activity. There is almost no limit to its work-power. The trained runner can tire out a horse or a hound. The trained lifter can raise twenty times his weight from the ground. The trained acrobat can outstrip any animal in feats of agility and muscular skill. In endurance a human being can undergo more pain, suffer longer from thirst and endure starvation with less discomfort than any other member of the higher orders of the animal kingdom. But on account of the artificial conditions imposed by social and civilized life, health is the exception and ill-health the rule. The average human mechanism is out of order, and through ignorance or neglect is kept out of order during the major part of life. No matter what the cause, the results are monotonously similar. Whether disease is present or absent there is a weakness and a lack of the power of

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Horsford's Acid Phosphate.

In dyspepsia the stomach fails to assimilate the food. The Acid Phosphate assists the weakened stomach, making the process of digestion natural and easy.

DR. R. S. MCCOMB, Philadelphia, says:

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DR. W. S. LEONARD, Hinsdale, N. H., says:

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exertion which are familiar to all. Traced down to its ultimate causes each case will be found to result from the condition of the blood. Sometimes it is impoverishment, sometimes it is impurities and sometimes, it is an excess of one element at the expense of another in the vital current. Whichever of these three causes it may be it will always be found that when there is debility the blood is in an unhealthy condition. There is no end to the list of examples which illustrate the fact. In some instances the blood refuses to clot and the slightest scratch is almost as dangerous as a deep wound. In others the blood is so thick that it does not circulate freely and expresses itself either in a corpse-like pallor or else in hideous darkred eruptions. In others again it does not supply the muscles with the force required for active work, and in still others it no longer affords the brain the energy demanded by intense consecutive work. Probably every one has noticed the natural complexion of those suffering from debility. It is white, gray, yellow or brown, and with it is always an expression of either pain or fatigue. Each and all of these mean that the machine we call the human body is out of order and needs repair. The best remedy in the case is simplicity itself, and consists in utilizing the virtues of Ayers' Sarsaparilla, the only really scientific blood purifier known to modern pharmacy. Its action is merely to restore the blood to its normal condition by expelling all humors and impurities and by raising the vital functions to a healthful and regular activity. In a few days after the patient has begun its use the weakness disappears, the complexion resumes its ordinary appearance, the eyes become bright, and the brain and muscles once more do their work with satisfaction and delight. Many of the medicines produce the same result in part, but only Ayers' Sarsaparilla does it with such thoroughness as to leave no sequelae, or after-effects.

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OVERCOMING THE FOOD PROBLEM.

An Italian named Succi is entertaining the New York community, and public interest in general, with an attempt to fast for forty-five days, his only diet being a thin liquid which he claims to have discovered. His experiment began November 5th, and at the end of the first fortnight he was in excellent physical and mental condition, though he had lost about twenty pounds in weight. This Succi has displayed his power of abstention from food on previous occasions, his longest fast, we believe, having been of forty days' duration, an exploit that has also been recently achieved by another Italian named Merlatti, after the example set some years ago by our own compatriot, the famous Dr. Tanner. Succi is carefully watched by details of medical men in order to insure honest starvation, and he receives numerous visitors whom he entertains in cheerful manner. His experiment is attracting much attention, but in all cases of this kind there is a lurking suspicion in men's minds that nourishment is partaken of in some surreptitious manner. We doubt whether in any single instance there has been convincing proof that fair play prevailed from beginning to end. One doubtful or suspicious member in a committee is sufficient to render valueless the whole experiment. There is also the possible dishonesty of the fasters themselves, and it may be remarked that in no experiment of the kind hitherto performed has fraud been impossible. A man who walks about the streets, and who receives crowds of visitors daily, may, by the aid of an intelligent friend, obtain food in spite of the strictest surveillance. Naturally, these experiments of Succi and Merlatti have brought forward numerous imitators, and many Italians may be met here who profess to be able to fast three, four, or even six months. Some, like Succi, pretend to possess a marvellous liquor; others, like Merlatti, do not. There is one faster in Brussels, another in London, a third in Algiers, while others flock in to Paris from different towns; and the daily papers publish a great number of anecdotes of persons of all descriptions and ages and colors who have lived longer or shorter periods of time without taking a morsel of food. But these stories are not much believed in. Many comments have been drawn forth from medical quarters by the fasting experiments mentioned, M. Bernheim, of Nancy, offering the ingenious suggestion that they may be accounted for on a theory of "auto-suggestion." The *Sun*, whose editor is a distinguished adept in the occult mysteries of gastronomic science, views the possible success of Succi with painful forebodings. It says: "The man who can abstain from food for forty-five days, and enjoy himself all the while, might possibly abstain for the rest of his life, thus giving an example to mankind. And if it should turn out to be feasible for one man to do this, other men may try to do it, and yet others might do it successfully, until there would be a prospect of the abolition of the most costly habit of our fallen race. And if it should be abolished, human progress would cease, and the experiment of humanity upon this globe would turn out a failure."

A CHANGE OF TASTE.

Silk as a dress material is, according to a writer in the *N. Y. Sun*, rapidly declining in fashion, and for the past year there has been a great over-production of goods—two causes which have had a depressing effect on the trade. There have been several failures recently. Paterson is the Lyons of America, and thousands of people depend for their daily bread on its silk mills. It is calculated that there are over 150 establishments in the place devoted to the silk trade and its many branches. For over a year the popularity of silk for dress goods has been steadily decreasing. Women have found that fine wollen cloth will last twice as long, costs half as much, and is just as pretty as silk, and consequently the demand for that article has declined. Today an all-silk dress is rarely to be seen on the street. It happened that, with the falling off in the demand for silk for dress goods, there came an increased demand for silk ribbons for trimming purposes and silk for decoration. This large demand attracted many outsiders into the silk-producing business, and many of them made fortunes. The inexperienced, however, simply turned out all the stuff they could and glutted the market. The result was that the supply far outran the demand, and prices fell. The impression prevails among manufacturers that after a few months, when many of the smaller and inexperienced people will have failed, the supply will have diminished sufficiently to enable the industry to regain its old prosperity.

THE HEIGHT OF CLOUDS.

Prof. Moller, of Carlsruhe, has made some interesting observations on clouds. The highest clouds, cirrus and cirro-stratus, rise on an average to a height of nearly 30,000 feet. The middle clouds keep at from about 10,000 to 23,000 feet in height, while the lower clouds reach to between 3,000 and 7,000 feet. The cumulus clouds float with their lower surface at a height of from 4,000 to 5,000 feet, while their summits rise to 16,000 feet. The tops of the Alps are often hidden by clouds of the third class, but the bottom of the clouds of the second class, and especially of the thunder-clouds, often enfold them. The vertical dimensions of a cloud observed by Prof. Moller on the Netleberg were over 1,200 feet; he stepped out of it at a height of about 3,700 feet, and high above the mountain floated clouds of the middle class, while veils of mist lay in the ravines and clefts. The upper clouds were growing thicker, while the lower ones were dissolving, and soon it began to rain and snow.

IN RE STANLEY.

The newspapers of Great Britain are almost unanimous in the severity of their criticism of the Stanley imbroglio. The Barttelot controversy they declare shows the Emin relief committee in a very bad light, and it is their procedure which is attracting most attention at this moment. When Assad Farran came to England after making on the Congo the most terrible charges against Stanley's officers, the committee kept him in their custody the whole time, carefully locked him away from newspaper men, and having frightened him, made him sign a declaration that his previous statement was false. Now the people are angrily asking if the Emin committee bribed Assad Farran to retract his story. The *Pall Mall Gazette* is demanding a full inquiry in strong terms. The *Star* says these revelations throw "a hell-fire flash" on the opening of the Dark Continent. It urges that a petition should be got up to Lord Salisbury, demanding the concessions which he has since granted to the promoters of the Emin relief project should be withdrawn. This business, the *Star* continues, "has stem-

med the torrent of cant which flowed out over Stanley, and will prevent its repetition on any future exploit." The public tide in England is turning against Stanley as well as against his officers. The people are comparing his achievements at the head of an army with what had previously been accomplished almost unaided by Livingstone, Burton and Speke. They are unearthing his records of hostile encounters with the natives, and they are beginning to bracket him with Jameson and Barttelot as hypocritical humbugs who pretend to go to Africa for Africa's good and then act as marauding adventurers and bloody-minded martinets. It is becoming pretty certain that the upshot of the controversy will be the appointment of a royal commission, or some such body, to inquire into the whole of the circumstances connected with the inception and execution of the expedition for the relief of Emin Pasha. The people are getting disgusted with the prolonged personal controversies, and want to have the facts brought to light in a manner which shall convince the world that the truth has been told.

THE INHABITANTS OF MARS.

WHAT WILL ASTRONOMICAL INVESTIGATION REVEAL TO FUTURE GENERATIONS?

The eminent French astronomer Camille Flammarion recently published a brilliant story describing an ideal journey through what is popularly called "The Universe," in the course of which a visit was made to the inhabitants of the planet Mars. The same idea is discussed in a letter from the Washington correspondent of the Boston *Transcript*, dated October 24th, from which we reproduce the following extract:

"The astronomer of the National Observatory, Professor Hall, who made the famous discovery of the moons of Mars not long ago, spoke of those two interesting satellites yesterday as each being about the size of a forty-acre lot. Revolving about the planet like two pretty little golden shuttles, one of them presents the phenomenon of travelling round more than three times as fast as Mars himself does. Thus is produced a very surprising appearance of things from the point of view of the Martian inhabitants, who see this rapidly-moving moon seemingly rising in the west and setting in the east, while its companion, in reality circling in the same direction with it at a speed comparatively slow, rises in the east and sets in the west. In this way both moons are seen in the heavens at once, one going one way and one the other. They are doubtless dead spheres, like the one that pursues its endless journey around the earth, and are not supposed to be made of green cheese. It is an astonishing fact that these two moons of Mars so recently discovered were referred to with much accuracy of description by both Voltaire and Dean Swift in their satirical writings, thus anticipating astronomical science, at which their sarcasms were aimed, by a century. It was all guess on their part, but assuredly one of the most remarkable guesses ever made. Describing his voyage to Laputa, which was inhabited by a people given over to the science of astronomy, Gulliver says: 'They have likewise discovered two lesser stars or satellites which revolve about Mars, whereof the innermost is distant from the planet exactly three of its diameters, and the outermost five of the diameters of the planet; the former revolves in the space of ten hours and the latter in 21½ hours.' Now, the fact is, as discovered only the other day, that Mars really has two moons, an inner one and an outer one. The diameter of Mars being a little over 4,000 miles, Gulliver's estimate for the distance of the inner moon from the planet was about 12,000 miles, whereas it is actually 10,000 miles away. For the outer moon Gulliver gives 20,000 miles as the distance, which is really only 15,000 miles. So he was only 2,000 miles off the fact as to one moon, and 5,000 miles as to the other. Gulliver mentions the time of revolution for the inner moon as 7½ hours; it is actually 10 hours. The time for the outer moon is set down by the imaginary traveller at 20½ hours; in fact, it is a little over 30 hours. Pretty good for a guess at moons that never offered to human observers until a century later the slightest evidence of their existence. Voltaire described the journey of Micromegas, an inhabitant of Sirius, who left the great Dog Star for a visit to the solar system. 'He traveled,' wrote the satirist, 'about one hundred millions of leagues after leaving Jupiter. Coasting by Mars, he saw two moons circling about the planet, which have hitherto escaped the observation of astronomers on the earth. Professor Hall has named his moons Deimos and Phobos, after the attendants of Mars, who are spoken of in Book XV. of Homer's Iliad as helping to accoutre the God of War for conflict:

> "'He spake, and summoned Fear and Flight to yoke
> His steeds and put his glorious armor on."'

Professor Hall says that he has little doubt that Mars is inhabited—perhaps by human beings like ourselves. Conditions there are suitable to such life, and strongly resemble those found on the earth. Its more eccentric orbit takes it at times in its journey around the sun farther away from that great source of heat, so that its winters must be more severe; but cold is modified by atmosphere, and it is known that Mars has an atmosphere, because clouds are frequently seen obscuring its surface. The planet, the diameter of which is one-half that of the earth, is about equally divided as to its area between land and water. Its poles are capped with ice and snow, and these white caps, plainly visible through the telescope, increase in size in winter and diminish in the Martian summer. Professor Hall has no difficulty in seeing through the mighty telescope at the observatory the wonderful "canals" mapped out by Schiaparelli, the Milan astronomer, on the surface of Mars. These canals, so called because they don't look like anything else in particular, and also because they seem invariably to connect sea with sea, intersecting every which way. must be several miles in width, as well as thousands of miles in length. Whether they are great roads, canals, bridges, or any other sort of public works, there is certainly nothing approaching them in this world. But Professor Hall does not think they are artificial at all. Though entirely at a loss to explain them, he supposes that they are natural markings on the planet. The question whether other planets are inhabited is always an interesting one. It is certain that the four great outer ones—Jupiter, Saturn, Uranus, and Neptune—cannot support animal life. Their density is small and their consistency more or less liquid and gaseous. Jupiter, biggest of the planets, the diameter of which is more than ten times that of the earth, is a sun not yet quite extinguished and even now giving out heat. From time to time a spot appears on its surface, which is a black hole in the midst of the fire big enough to drop the earth into. Saturn is hot, too, while Neptune and Uranus are so far off that nothing much can be ascertained about them, beyond the fact that Uranus has four moons and Neptune one. There may be life on Venus and Mercury, though it must be warm, inasmuch as Venus is a third nearer the sun than the earth, and Mercury is not half so far away. All these planets, together with the sun around which they revolve, are travelling at a velocity inconceivable directly north toward the constellation of Hercules. Doubtless the solar system on this mighty journey is pursuing the path of a vast orbit around some central point unknown. Once it was thought that this point was Sirius, and again that it was Alcyone, in the Pleiades; but neither is true. Our sun and its system are but a small affair altogether anyway. What we call the orb of day is only one-eighth the size of Sirius. And even this latter giant sun is far surpassed in magnitude by ever so many other suns that are wheeling through the heavens with their attendant constellations in plain sight. To make them more beautiful, these suns are of different colors. Vega, in the constellation of Lyra, has a huge sun of an exquisite blue tint, Sirius is white, and Alpha, one of the several gigantic suns in Orion, is red."

SCIENCE SENSES.

HOW MEN SUPPLEMENT THE DEFICIENCIES OF THEIR ORGANIZATION.

(*Dorsey Barton, in Scientific American.*)

In the past ten or fifteen years there has grown up a need for special training of the senses, in order to use properly scientific instruments, not in study or in any way applying to it, but as necessary adjuncts of business communication in every-day life. First on the list will come the telephone. Most persons using one for the first time find themselves absolutely *hors de combat*, unable to recognize a familiar voice, and are only conscious of the most helpless hearing-deafness. After a short training the ear and mind adjust themselves with wonderful nicety to the new duty required of them, and learn to recognize a voice as unerringly as though talking face to face with the individual who is, perhaps, miles away. Following closely in the wake of the telephone, which may be looked upon as the pioneer of the inventions which will later rely upon the auditory nerves or hearing for their use, is the graphophone, a marvellous little machine, whose fitness for the work it has to do is so wonderful that, were it not explained on purely scientific principles of natural laws, man would think the inventor of it in league with the "Buyer of Souls." It records sounds by the vibrations of the air acting on a steel stylus, which is so placed that it cuts or traces fine lines on a cylinder of rubber coated with wax. These lines are of varying depth, according to the force of the sound waves. The vibrations or sounds are reproduced by the aforementioned cylinder being revolved under a small stylus to which is attached a pair of tiny ear-trumpets, which are so adjusted that they transmit with absolute fidelity every sound wave to the ear. It is impossible to predict the boundary line of scientific discoveries, and the uses to which man may put them in the near future. But to follow out the idea of the trained senses, take the vision, how the microscopist with his little instrument is every day opening new vistas. It is only the supreme intellect of the human mind which renders what may be called the brute senses of man of use to him, because, when untrained, they rank far below the senses of the animal, though in the latter they are not so evenly balanced as in man. The eagle and condor have wonderful vision. Of these birds it is said that the former can face with an unflinching eye the sun when shining with full noon-tide glory, and of the latter Prescott, in his "Conquest of Mexico," says, "The sight of the condor of the Andes is almost beyond belief. When a horse or mule drops by the roadside, scarcely a moment passes before one or more of these huge birds may be seen hovering over the unfortunate animal, proving plainly that they are guided by sight alone." The sense of smell in animals is perhaps found in the highest perfection known in the well-bred bloodhound. This animal will follow a trail hours after the man or animal has passed, and never lose it, even though it had been passed over by hundreds. The sense of touch possessed by the clumsy-looking elephant is most wonderful. The tough-looking hide which covers him would never make one think he could lay claim to the sense of touch in any degree of perfection. Man supplements what he lacks by using his knowledge of the laws of nature. Thus, with the aid of the microscope and telescope, he can compete with the eagle and condor. Up to the present time he has not invented any instrument which will aid in distinguishing odors—put passing over that, he has covered nearly the entire range embraced by the five senses—sight, taste, touch, smell and hearing. When we speak of trained senses, we do not for an instant mean to imply that the man of the present age is better equipped by nature with the senses than his ancestors were, but that by the aid of scientific instruments he has supplemented the use of these senses to an almost supernatural extent. However, beyond a certain point he cannot go, as it is only in his power to use intelligently the things that be, not

to create. Every invention of man thus far has only consisted in some new or perhaps forgotten application of a law of nature, and is not in any way dependent on the inventor personally, save in his ability to make his knowledge of practical use to the majority of mankind. The man of science is the idol of the present age. His daring and success in the field of invention have blinded the eyes of the people to the fact that there can be a limit to his power, and make them lose sight of the reality that he is only a pupil in the school of nature, where the doors are open to all. It is not probable that any special benefit will be done mankind physically by this training, for it does not demand any abnormal conditions. It is simply a better understanding of our physical capability of using our senses by intelligently applying them to obtain a result known to be as certain as the law, "water seeks its own level." There is a vast change in the tendency of the inventors of the present age, and this generation especially. Force is guided rather than controlled, and the result is that machinery has become more delicate and often more simple, but requiring by that very fact a more highly educated mind to operate it than did the crude machinery of the early inventors, where muscle was as much needed as knowledge. All that is changed. Ignorance is now often death-dealing, particularly when electricity is the motive power, or where chemical compounds are used. Every day adds to the necessity for a practical working knowledge of the numerous inventions which are now found in daily use in all civilized countries the world over. No one who has ever read "John Halifax, Gentleman," can forget the masterly description given of the personal antagonism felt by the workingmen to the machinery which was placed in his mill by the hero. In their blindness they could not realize that mental labor placed them on a higher plane than manual labor, and that machinery at its best can only supply muscle, not mind, and that they were being given, by the very machinery which they were bent upon destroying, their one chance to be something more than mere machines themselves. It is to be hoped as the world grows older it grows wiser, and that we are being carried to a "Golden Age" on the wheels of the inventions of the twentieth century.

BOTTLE MAKING.

A POPULAR AND COMPREHENSIVE DESCRIPTION OF THE PROCESS.

Perhaps a glass bottle is the product of a greater variety of skilled and unskilled labor than any other article on the market, and yet it is sold at a price so ridiculously low that one would think it had been gathered wild somewhere in a wood where phials and flasks and demijohns hung upon the branches all seasons of the year and invited all the lazy men of the neighborhood to gather them ready for the market. In the first place, sand is required. Only in a few places in the country can sand be found which will be available for the manufacture of glassware. Fine as is the sand around Lake Michigan, it is quite useless for this purpose, as the writer was informed, and that at Millington, Ill., has been selected by the only concern of the kind in the city, as the best in the West. It is of a peculiarly pure, white character, very clean and of exceedingly fine grain. It is digged from the pit at Millington by cheap labor, is loaded on board the cars there and hauled to Chicago. Here it is shovelled from the cars and passed through a screen by a man who earns a little over a dollar a day. It is placed on an elevator and carried up to the second story of the building, where other men, at a much better wage, mingle with it the ingredients needed to make it ready for the furnaces. Soda ash, lime, arsenic and manganese are mixed with the sand in a proportion which is not generally discovered outside, and which is one of the secrets of the business. The mixture is then carried to the furnace and loaded into the pots, each of which will hold about two barrels of the material. Eighteen hours of the fiercest heat are required to melt it, and then the blowers are ready for work. But some other things are to be considered before this stage has been reached. Each of the pots in which the glass is melted costs the company $100. They are made of German clay, by hand, and are the product of Pittsburg workmen. One pot is expected to last ten months, the full limit of the season, but some of them will break before they have been in service for a day. When broken, the pot must be lifted out of the furnace, and a new one, heated red hot and thoroughly tested, must be swung in its place. For the heat in the furnace is never allowed to go down from the time the shops are started up in September till they shut down in June. A great chimney, itself shaped like a round glass bottle, forms the centre-piece of the factory. At its base a fire of intense heat is made by the burning of crude petroleum, sprayed into the furnace by a column of air. Right up through the centre of the chimney is a hollow space called the "eye," and abutting upon this are the pots filled with material for melting. The hot air which escapes at the top is caught by a canopy and sent back to mingle again with the oil, and furnish fuel over and over again. Ten pots form the circuit of the furnace, and each of them is called a shop. Three men work at a shop; one of them is a journeyman and the other two are apprentices. Each is supplied with a blowpipe of iron. It is simply a hollow rod some four feet long, one end smoothed for contact with the lips and the other made somewhat larger. The blower thrusts this larger end into the boiling liquid glass, twists it around for a moment and takes out a quantity of material sufficient for the sized bottle which he is expected to make. Here is one of the nicest bits of judgment on record. A good workman will know when he has enough glass to make a half-ounce bottle, and will lift it out on the end of his pipe, roll it and form it for a moment on his iron table, and will then place it in the mould, blow it into shape and lay down his pipe, without having taken a grain too much or too little. If he takes too much there is a waste, and he will have to answer for that in the long-run. If it be too little, there will not be enough to make the bottle of the required weight, and he will lose on that also, as every bottle is weighed before it has left the shop. One thing about this latter consideration is that the bottles designed for prescription use must weigh exactly what they are represented to—that is, they must have exactly the right amount of material in them, no more, no less, or else they are of no earthly value to the druggist, who is held to strict accuracy by the physicians and those who buy of him. The blower knows all this, and so when he thrusts his pipe into the mass before him he twists it around for a moment and brings it out with the exact amount clinging to the end—for all the world like a bit of taffy on a stick—puts the end of the pipe to his lips, and blows the rudimentary interior into the bottle. It is not a bottle yet, however, but a yielding lump of red-hot glass, soft and willing to run in any direction. Right before the blower sits a little boy with two iron moulds, each cleft through the middle, and swinging on hinges at the back. The boy opens his moulds, and the formless bit of glass is dropped into the opening. Waiting for an instant till the pliable stuff runs almost to the bottom, the boy closes the mould and the blower puffs out his cheeks in the final blast. In an instant he has enlarged that interior, has forced all the glass to the sides of the mould, and has held it there for the time required to set it into shape. Then he lifts the pipe, and the glass swells above the mould into a globe of the most exquisite thinness, which finally explodes with a sharp report, and the blow-pipe is free. After a moment the boy opens his mould, allows the air to strike the bottle, and then after another pause, lifts it out with a pair of tongs, and sets it on a scale to determine if the weight is correct. Another little boy comes along with a sort of a shovel, on which he loads all the bottles ready for him, and takes them to another workman seated before a furnace known by the name of the "glory hole." Each of the bottle-necks is thrust into an aperture in the furnace, and when they are again red hot they are withdrawn by a man who places an iron in their mouths and turns it about until all the waste glass has been rubbed away. This glass, together with that lost at the moulds, is as thin as the veriest cobweb, and can be bent in any shape. Yet it will break readily, and can then be blown about by every breeze that visits the workroom. When the bottles come from the "glory hole" they are too tender to be subjected to outside air. If placed on the outer ledge of the window they would at once break into a hundred pieces. But they are loaded into a tray and shoved into the annealing furnace, from which they pass from a burning heat to a degree of coolness that fits them for use. When they come from the annealing furnace they are ready for inspection, and all that are misshapen or otherwise unfit for sale are taken out, broken, and sent back to be again melted. And all these bottles are taken from the tale required of the workman. He gets credit for none but good bottles. Glass-blowers are paid by the piece, and he is a poor workman who cannot earn $5 a day. Many of them get as much as $8 for eight hours' work. But they are a rapid lot of men, and it takes a good many bottles to keep them. These latter are purchased outside, and are not so empty and harmless as those they make themselves. So that, however good wages they may earn, the glass-blowers are seldom a "forehanded" set of men. But they are all jolly good fellows, and they keep their families in good shape, being proud of their honors and of the fact that theirs is a class of labor that is not overdone. They are independent, and can afford to be. The boys who work at the business, and who ought to be in school, but who probably wouldn't be, get sixty cents a day. The heat in which all of them work is intense, and here in the warm months one cannot stand at the furnace over half an hour at a time. The work is interspersed with frequent rests. Yet, in spite of that, the output of the factory in question is something remarkable. Thousands of bottles, in sizes from half an ounce to four ounces, are turned out every day. Many special sizes, and some of curious shape, are made for the trade, but the method of work in all is about the same. The work is very curious, and the factory is visited almost every day by persons interested in the singular process.—*Chicago Herald.*

CRUSHED STEEL FOR CUTTING.—Crushed steel is said to be coming into use for cutting stone. It appears to be made by quenching very high-carbon steel in cold water from an excessively high temperature, such as would overheat steel for most purposes. This renders it not only hard but rather brittle, so that it is possible to pulverize it. It is then crushed in a stamp mill and sifted closely to size. It is said to be not only cheaper but more effective than emery, giving a better and quicker polish, and lasting much longer.

ONE GOOD TURN, ETC.—"Can I use your telephone a moment?" asked a lady, stepping into a drug store. "Certainly," said the polite drug man, and he engineered her to the back part of the store, past counters and bottles, to the telephone itself. "I cannot reach it," she said, anxiously. "Can I telephone for you?" asked the druggist, with one eye on his store. "Y-e-s. Please call up Smith & Blank's drug store, and tell them to send Mrs. —— a box of mustard leaves and a porous plaster. I have an account there," she kindly explained to the paralyzed druggist.

DEEP MINING.—The mine at St. Andre du Poirier France, yearly produces 300,000 tons of coal. The mine is worked with two shafts, one 2,952 feet deep and the other 3,083 feet. The latter shaft is now being deepened, and will soon touch the 4,000 foot level. A remarkable feature of this deep mine is the comparatively low temperature experienced, which seldom rises above 75 deg. Fahr. In the gold and silver mines of the Pacific coast, at a depth of less than half that of the French coal mine, much difficulty is often experienced in keeping the temperature low enough to admit of working. In some levels of the Comstock lode the temperature rises as high as 120 deg. Fahr.

OVER-EXERTION.

THE PROPRIETY OF MODERATION IN ATHLETIC EXERCISES.

The *Providence Journal* quotes Dr. Patton, Chief Surgeon of the National Soldiers' Home at Dayton, Ohio, as saying, in an interview in Pittsburg the other day, that of the 5,000 soldiers in the Dayton home "fully 80 per cent. are suffering from heart disease in one form or another, due to the forced physical exertion of the campaigns." And he made the prediction that as large a percentage of the athletes of to-day will be found twenty-five years from now to be victims of heart disease, resulting from the muscular strains that they force themselves to undergo. As for the likelihood of exercise to prolong life, it may be said that according to the statistics of M. de Solaiville, there are more people living in France to-day who have passed the age of sixty than there are in England, the home of athletic sports. And there is probably no nation in Europe more adverse to muscular cultivation for its own sake than the French. Great athletes die young, and a mortality list of Oxford rowing men published a few years ago showed that a comparatively small percentage of them lived out the allotted lifetime. Dr. Jastrow has demonstrated in some very elaborate statistics that men of thought live on an average three and a half years longer than men in the ordinary vocations of life.

CHINESE BEVERAGES.

THE PREFERENCE FOR HOT DRINKS IN HOT CLIMATES.

A traveller in China named Abel gives the following amusing description of the public-houses he visited in the city of Tongchow: "They were large open sheds, fitted up with tables and benches, and affording means of gambling and drinking to the lower orders of the people. They were generally filled with players at dominoes or cards, who seemed to enter with intense earnestness into their game. The cards were small pieces of pasteboard, about two inches long and half an inch wide, having black and red characters painted on them. The beverages most largely partaken of in those houses were tea, wine and Sam-su. All the guests were smoking from pipes of various lengths, from two to five feet, formed of the young and tender twigs of bamboo, fitted with bowls of white copper about the size of a thimble. Every person smokes to excess, and should any one in company refuse to smoke he is accused of affectation." Another traveller, Mr. Dobell, tells us that in their cheerful and idle moments the Chinese amuse themselves at a game on the fingers to procure drink and enjoyment, and they call this game hona thsionan, or tsoeymoey. It is played thus: The wine cups being filled, the two persons engaged stretch forth their right hands towards the centre of the table, with their fingers closed. When the hands come almost in contact, they open as many fingers as they please, and each person cries out the number he opens, as one, three, five, etc. Whoever hits on the exact number of fingers presented by both persons, obliges his adversary to drink. "I have seen," says he, "this game continued for an hour until one of the parties, finding himself the loser and his head affected, is forced to retire." It is a game that would pass muster in this country if the winner, who had the privilege of compelling the other to drink, had also the compulsory, according to the rules of the game, privilege of paying for it. Another of their little drinking games is worth noticing. A small bunch of flowers is passed from hand to hand during the beating of a kettle-drum; but whichever one has it when the drum-beating stops is compelled to drink a cup of wine as a forfeit. Not a bad game if played fairly, and mightily like our old "hunt the slipper." The public inns and victualling houses are seldom frequented for the mere love of drinking; and, although intoxication is a common vice amongst these people, the habitual drunkard is rarely to be found. Travellers dispute about this, and Mr. Ellis says that his experience of the Chinese is that they are confirmed drunkards, but by a habit of superior decorum they have the decency to get drunk at home and not roll about the streets in a state of intoxication. One of the laws enacts that "a man, who, intoxicated with liquors, commits outrages against the laws, shall be exiled to a desert country, there to remain in a state of servitude," and this seems to be a law with the extraordinary advantage of being partly fulfilled in advance. What is the drunkard but a slave to his vice? and then, perhaps, it would be well to learn how he could be enslaved in a desert country. Rice-wines in China are all drunk warm, as, indeed, is almost every other kind of fluid. Why this custom is practised it is almost impossible to say, unless the sickly temperament of the Chinaman renders it advisable. They are, as a race peculiarly subjected to lung and bowel disorders; hence, perhaps, the opinion gains strength that fermented and spirituous liquors are best taken warm. In all warm climates the idea prevails that heated drinks are the more wholesome, and certainly experience pronounces them best suited to alleviate the sensations of fatigue. Even in the parching climate of Hindostan we are told that weak but warm liquors are always kept ready at the public inns, or choultries, for travellers. Through China, in like manner, warm tea and other hot beverages are supplied at the public inns situated along the roads, canals and rivers. This drinking of hot drinks in a hot climate is remarkable, and so scrupulous are the Chinese upon this point that, rather than drink their liquor cold, they plunge the vessel in which it is contained in boiling water until it is warm enough to drink, or possibly they may warm it over a fire. And here we may add a little habit that might be copied in this country with advantage to health. The upper classes are so particular about the state of their drinks that, besides the heating of all manufactured liquors, they seldom take water unless it has first been distilled in order to ensure its freedom from animalculæ, or, indeed, any other impurity. By dint of boiling and filtering there can be no reason for distilling; but the average individual is a great deal too careless as to the state of the water he drinks. Given a really pure water, and teetotalism would find much more extended favor. As it is, well, no well-regulated family should be without a filter. They are sold cheap enough now in all conscience. Some philosophers account for the Chinese and other Orientals drinking their liquors warm by suggesting that in all hot countries the stomach loses its activity by a too copious perspiration; and, consequently, everything which warms it not only invigorates it, but repairs its losses. "When we compare," says another, "the Chinese custom of drinking warm beverages with that of the Russians, who, when in a profuse perspiration, after coming out of a warm bath, drink copious draughts of mead, as cold as it can be procured, without sustaining the least injury, the contrast is remarkable." The drinking-cups used by the Chinese are either of silver, porcelain or precious wood. Very small cups are used at first, but before the entertainment is half over they are changed for those much larger, and should always be offered the guest quite full, otherwise the host would subject himself to some such unpleasant remark as the following: "This glass is too deep; half of it must be cut off, for if the upper half cannot hold wine of what use is it?" Distillation is very much practised in China, but the apparatus and entire process is crude, clumsy and ancient—possibly having been unimproved for many a generation. The skill of these people in distilling is exercised in preparing a coarse brandy from rice or millet, and not only this, but they distil the juice of palms and other fruits, and more especially excel, according to some authors, in the manufacture of an ardent spirit, fit for emperors, produced from the flesh of a sheep. Surely this is not the counterpiece to those stimulating beef-tea drinks so famous throughout the country. Can it be that even these are not free from ardent spirits? Dr. Halde tells us that the nature of the process of this meat spirit is yet a secret to Europeans; some, indeed, have stated several vegetable substances have been employed in it, but this assertion rests upon mere conjecture. The use of meat liquor was first introduced by the Tartars, whose fondness for the repasts which the flocks and herds of their native wilds afforded, induced them to subject to the action of the still the flesh of an animal that had long formed the basis of a more simple beverage—that is lamb, as lamb wine. According to Grosier, the Chinese term for this liquor is Kau-yang-tsyew. It is reputed to be a very strong, nutritious beverage, and the Tartars delight to get drunk on it. In Surat spirits are distilled called "spirit of mutton," "spirit of deer," "spirit of goat;" and these derive their names from the practice of throwing into the still a joint of mutton, haunch of venison, or a quarter of goat, with a view, we are told, of softening and mellowing the spirit. In this country beef-wine is not unfamiliar to invalids but is not the sort of thing to get drunk on. In Quang-tong the inhabitants distil a very pleasant spirit from the flowers of a species of lime-tree. These flowers are very saccharine, and generate fruit as large as a man's head, of which the rind is like an orange, and the pulp within either white or reddish and a cross between sweet and sour. The wines and spirits of Europe are, however, now being imported largely into China, and are held in much higher esteem than those of home manufacture. Beer also has obtained a substantial foothold.

SCIENTIFIC ACCURACY.

THE MEASUREMENT OF MINUTE FORCES.

With the increased attention now being given to the study of physics, the measurement of the most minute natural forces has become an important matter. The weakest currents of electricity—even those developed by the beating of the heart—can be transformed into mechanical movements, and their existence made evident to the senses. Even the infinitesimal difference in the force of attraction of gravitation between an empty hall and one with an audience assembled therein, can be made perfectly visible to the audience itself. The general principle upon which all these measurements depend is that of the *torsion* or twisting of a fine thread or fibre to which a small mirror is suspended. A ray of light is thrown upon the mirror, which reflects it upon a screen. Any force, therefore, which moves the mirror in the slightest, is at once shown in a greatly magnified degree by the movement of the spot of light upon the screen. It is like applying power to the short end of a lever, only in such a case our lever is a ray of light, without inertia or weight, and moving without friction. It is evident that the finer the thread by which the mirror is suspended, the more sensitive it will be to the action of forces tending to twist it, and a perfect means of suspension for the mirror has long been sought after by physicists. Fine hairs were at first used, but even they were too large, and offered too much resistance to the forces under investigation. Fine metallic wires were tried, and the much finer thread spun by the silkworm. Glass was drawn out into microscopically fine threads, which served a good purpose, the principal objection being their somewhat imperfect elasticity, which prevented them, when once twisted, from returning to their original position. In the threads of quartz, first produced by Mr. Vernon Boys, we have a substance which is not only perfectly elastic, but is unaffected by atmospheric changes, and is strong enough to support a considerable weight, while the threads can be made much finer than anything formerly produced. They are made by shooting from a little bow an arrow consisting of a straw, which has been previously attached to a small cylinder of quartz, one end of which is fused by the oxy-hydrogen blowpipe just before shooting off the arrow. As the arrow flies through the air it draws out a thread of quartz of an inconceivable fineness, and so

light that it will float in the air. Some of these fibres have been estimated to be less than one millionth of an inch in diameter; or, to give an idea of their fineness, if a cubic inch of quartz was drawn out into such a thread, it would reach six hundred and fifty-eight times around the world! The size of thread, however, most used in actual work is about 1-10,000 of an inch in diameter, and is ten thousand times more sensitive to a force of torsion than the finest glass threads ever made. With such a quartz thread Mr. Boys has shown directly to a large audience the attraction of gravitation exerted by spheres of lead of two pounds in weight upon smaller spheres weighing fifteen grains. This attractive force is calculated to be less than a thirteen millionth of a grain, and it is believed that it will be possible to measure a force two thousand times more feeble than this. These figures, although incomprehensible, are real, and like the wave-lengths of light, or the chemical molecules and atoms, stand for actual and definite mathematical relations. Their contrast with the magnitudes of the celestial bodies and spaces, which are the study of the astronomer, is most marked, and leads us not only to admiration and wonder at the construction of the universe, but also at the capabilities of the human mind which can conceive, and even, perhaps, imperfectly comprehend, such extreme manifestations of weight, mass, and energy.—*Popular Science News.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

November.

MEATS.—Beef, mutton, pork, venison.

POULTRY AND GAME.—Chicken, duck, geese, grouse, hare, partridge, pheasant, pigeons, rabbits, turkeys, widgeon, wild ducks, woodcock.

FISH.—Brill, carp, cod, whiting, salmon trout, perch, smelts, oysters.

VEGETABLES.—Artichokes, broccoli, celery, potatoes, turnips, cauliflower, cabbage, carrots.

FRUIT.—Apples, pears, quinces, grapes, nuts.

PRACTICAL RECIPES.

MUTTON SOUP.—Make a mutton broth, using about two pounds of meat to three quarts of water, or else use the water in which a leg of mutton has been cooked —there should be about three quarts; add one half cupful English split peas, nicely washed, one small onion, and cook gently three hours, adding a little more water if it cooks away much; before taking from the fire add salt and pepper to taste.

BAKING-POWDER RYE BREAD.—Scald a pint of rye flower with half a pint of hot milk, mix, and when cold add to it a quart of sifted wheat flower, a full teaspoonful of salt and two table-spoonfuls of creamed butter. Now add a table-spoonful of baking powder, mix briskly and add a little more milk to make it of the proper consistency, shape into long narrow loaves, put them in shallow baking-tins that are well greased; cover, and bake an hour in a moderate oven; remove the tin or paper cover and bake half an hour longer; brush over the top of the loaves while hot a little melted butter.

SPICED TOMATO BEEFSTEAK.—Take a thick steak off the round, cut deep gashes all over it and fill them with powdered cracker, allspice, cloves, and little bits of butter, pepper and salt; roll up tight and tie. Pour a can of tomatoes in a saucepan, lay the beef-roll in it, cover closely, and cook slowly for three hours. When done, unroll the meat, lay it on a hot platter, pour the tomatoes over it and serve.

TAPIOCA ICE.—Soak one cupful of tapioca overnight; in the morning boil until clear, adding one cupful of sugar and a little salt. Have ready a pineapple chopped; turn the boiling tapioca on it, stir, and pour in a mould to cool; when cold, turn out and eat with sugar and cream.

CORN PUDDING.—Twelve ears of corn, one quart of milk, four eggs, one table-spoonful of flour, butter size of an egg, half a teaspoonful of salt.

VALISE PUDDING.—One quart of flour, one table-spoonful of lard, one table-spoonful of butter, two large teaspoonfuls baking powder sifted in the flour, a salt-spoonful of salt, two cups of milk, or enough to make the flour into a soft dough. Roll the crust out about half an inch thick, lay on it one quart any kind of fruit, roll up and steam one hour and a half.

APPLE FRITTERS.—One pint of milk, three eggs, a little salt, flour to make a good batter, one cupful of chopped apples, one teaspoonful of baking powder sifted in the flour. Beat eggs very light, yolks and whites separately; beat the batter well, and add the whites the last thing. Fry in very hot lard and eat with powdered cinnamon and sugar mixed together—about one teaspoonful of cinnamon to a cup of sugar.

OPERA CARAMELS.—Boil one pound of loaf sugar, three-quarters of a cup of water to the crisp, then add a lump of butter the size of a walnut and flavor with vanilla; then remove from the fire and let it cool for a few moments, then work into a smooth paste with a wooden spoon. When the paste is quite cold roll it out on a slab dusted with powdered sugar and cut into little squares.

HAVE WOMEN SENSE?

SOME PERTINENT VIEWS OF WOMEN NEWSPAPER WRITERS.

A writer in the *Business Woman's Journal* says: One of the cleverest newspaper women I know confessed to me recently that she had become an utter pessimist in her opinion of newspapers and of the stuff they print. Her writing is principally along the line of specials supposed to be of general interest to women, and adapted for the columns or departments designed for the feminine mind. She also handles for her own paper most of the out-of-town exchanges, and she has found it, she says, to be an almost invariable rule that the sillier and more trashy of her screeds are widely copied in the newspapers, while those which are of a better sort in both subject and treatment are left unnoted. "The fact is," said she, "if I should write as well as I can, so that I really could take pride and pleasure in it, I should very soon lose my situation. If, on the other hand, I could bring myself to write the perfect 'trash' which I see is most popular, I could double my income. As it is, I reconcile my self-respect and my pocket-book by pursuing a medium course." I have talked with many experienced newspaper women on this topic of late, and their testimony is invariably like that quoted above. Many, however, unite with her in drawing from these facts an erroneous conclusion to the effect that the women readers of the newspapers do not want good things, nor even know them when they see them. The contrary is proved by the success of really first-class periodicals designed especially for women, such as *Harper's Bazar*, the *Woman's Journal*, *Good Housekeeping*, and those newer claimants of popular favor, the *Business Woman's Journal*, the *Woman's Cycle*, and the like; while the high-class monthlies confidently count on three-fourths of their readers being women. The fact is that women have no voice and no choice as to what shall be set for their perusal in the newspapers. With two or three notable exceptions among our large newspapers, the women's departments are edited by men. The stuff furnished by the syndicates comes next; and the articles to be used are usually chosen by men, who almost invariably select the most fantastic and improbable, the slangiest and loudest. When a paper has women writers upon its staff, even, who are expected to furnish original articles for the women's column, they seldom have much liberty, writing usually only what is ordered, while the final authority which accepts or condemns remains a man, who knows nothing about it. What can one do, however good intentions, abounding enthusiasm, or broad an outlook she may have, if the manager of her paper says, "The trouble with all you newspaper women is that you shoot over your reader's heads. The average woman never gets to be more than 16 years old. She leaves school then and marries and settles down. After that all she cares for is her crochet work and her babies and new cooking recipes; and that's what she wants to read about in the newpapers?" And yet the man who, to my knowledge, made the above remark is an unusually clever and able editor and manager, who has achieved an almost phenomenal success. With eyes wide open to every new thing in his profession, and brain quick to grasp any idea which might be turned to the advantage of his paper, the modern editor yet fails to read the signs of the times so far as women are concerned. He still persists in holding to his preconceived ideas of her, ideas obtained from goodness knows what source; for the type described above is as surely extinct as the dodo! He obtains the services of high-priced experts to take charge of his yachting, base-ball, military, political, labor, secret society, and a score of other columns, but he thinks anybody, especially any man, can manage the woman's department. The material which goes to make up that department consequently is not what a little honest investigation would show women to be interested in to-day, but what some man thinks women like, or should like. That newspaper will certainly score high in fame and fortune which shall be the first to give to woman's distinctive activities and interests—her clubs and societies, her education, her philanthropies, her duties public and private, her amusements, her thought, progress, and pursuits—the same attention now accorded to those of men; which shall represent fairly, in short, the woman's side of life. This cannot be done in a column or a department. The trouble is that most editors, when they devote any attention to women's affairs whatever, think they must give a lot of stuff which in reality no woman expects a newspaper to print or thanks it for printing—matter which she can find in better reliable form in the class periodicals on fashions and household matters. Let a newspaper keep to its text and print the news. Much of this is of equal moment to both men and women; but let it give news which is of importance to women alone as well as that which interests men only. If a prize fight witnessed by 500 men and a convention attended by as many women occur on the same morning, why is not one worth a column of space as well as the other? And if a man who knows all about prize fights and fighters be sent to the first, is it too much to ask that the reporter assigned to the other shall be able to grasp at least the idea of what it's all about? The reports made by men reporters of two conventions of women which were held recently in New York city—conventions by many delegates representing thousands of women all over the land—were, for the most part, perfectly exasperating in their blundering inaccuracy, their stupid indifference, and their utter frivolity and flippancy. There are scores of clever newspaper women in New York; but only two or three papers thought it worth while to see that they were set to do this work. Perhaps the first thing, after all, which the modern editor needs to learn is, that the modern woman who thinks at all takes herself seriously, very seriously indeed.

QUERY.—Kate Field has been examining some statistics furnished her by the Chicago Board of Pharmacy, and finds, to her horror, that American women spend sixty-two million dollars a year for cosmetics, most of which are made of zinc oxide, mercury, and other poisons. This leads her to ask this pertinent question: "How can women vain enough to paint and dye their hair bring forth children stalwart enough to resist temptations that lead to all manner of vice?"

WOMEN'S WORK.

PIANO TUNING SUGGESTED AS A FRUITFUL FIELD.

A few years since, not more than ten, in response to the rapidly increasing demand for practical instruction in tuning pianos, there was introduced into the New England Conservatory a department which should afford special facilities for the development of this important art. Among those who applied for admission were a number of young women. They were cordially welcomed, for Dr. Tourjee is another man who believes in the capacity of women to excel in various directions. Their progress was noted with special interest, for these were the first, so far as can be learned, who had undertaken, in Boston, at least, a systematic study of the theory and practice of tuning. To the great satisfaction of the management, their advancement was from the start both rapid and thorough, and before the first term was ended it became evident that a new field of endeavor had been found for girls. As time passed, the highest expectations were abundantly realized. The young women easily kept pace with the young men who were pursuing the same course, and amply proved their entire ability to excel in this new line of work. From that time the proportion of women to men students has constantly increased, until now they bid fair to be in the majority; and years of active effort by the women who have received an education in this department have proved beyond a question their special adaptation to the work. In introducing this new profession for women it was fully expected that the same prejudice and opposition would be encountered which have always greeted any innovation, and those who were instrumental in bringing the movement forward prepared themselves carefully to defend it. They knew that the objections would be just what they turned out to be. The first one was that young women would lack the necessary physical strength. To this they had the ready reply that the demands made upon the strength were not so great as were those made in factories, mills, sewing-rooms, or even kitchens; in fact, that the tuner's work was not so fatiguing as were many of the employments in which women were constantly engaged, and which came under the head of "women's work." The second objection made was that women, as a rule, lacked mechanical ingenuity. The only answer needed to this objection was to point to the many manufactories where the nicest mechanical skill was necessary, and which are crowded by women operatives. The third objection was that women lacked the power of application necessary for the acquirement of a difficult mechanical art. Time answered that argument as it alone could, and the experience of the years since the department was first instituted has proved that young women, with the naturally delicate ear and touch, possess peculiar qualifications for this work, and that the fine discrimination necessary for the tuning of an instrument is characteristic of them. The manual labor necessary to the accomplishment of this branch of work is calculated to make it healthful and strengthening, and the mental application is sufficient to impart zest and interest to it, while it is attended also with the satisfaction of immediate results. Aside from the limited amount of tuning done during the construction of the instrument, the sphere of the tuner in the homes of the people or in the warerooms of music dealers lies in sharp contrast to the life in shops and mills. The profession is conspicuously one in which there is, and is to be, plenty of room. A glance at the actual condition of the country, as concerns the tuning of pianos, and the numbers of instruments demanding constant attention, proves this. In the cities, naturally enough, the profession is fairly represented, although there the number of thoroughly educated tuners is limited, while, as I dare say many of you realize, in almost any part of the United States there are whole counties containing hundreds of pianos, with new ones being constantly added, where only an occasional travelling tuner can be found to hurriedly attend to them all. With the vast number of old pianos, which each year demand more care as they show additional signs of wear, and the thousands of new ones which scores of manufactories are producing yearly, to say nothing of many times the number of organs, there is surely no occupation which promises a more abundant and ever-increasing business than this of tuning. Every piano made requires care, whether it is used much or little; and as the country increases in wealth and the art of music becomes more universal, especially as pianos become lower in price and are in even greater demand than now, the question very naturally arises, who shall keep these countless numbers in condition to be used? This, then, is a new field of labor opening to women, another avenue in which our girls may seek employment.—SALLIE JOY WHITE, in *Wide Awake.*

VALUE OF EXERCISE.—In order to secure a long life and a green old age, somebody has said, and no one will dispute, bodily vigor should be sustained by regular, systematic exercise, avoiding all sudden strain and prolonged exertion as much as possible. Especially is this true of running, lifting, climbing, etc. And labor, while desirable in moderation, should never be prolonged till it produces exhaustion.

CONTENTED EXILE.—Dom Pedro is living in Versailles in rather poor health, but is employing every moment of his time. A New York gentleman recently returned from Versailles called on the ex-sovereign while there. He found him taking a great interest in art matters and a daily visitor to the galleries. If he hears of a new picture anywhere he goes to see it. He also studies Hebrew and Sanscrit, taking daily lessons from a noted German professor, and follows closely all the new developments in science. He is a member of all the important scientific associations in Europe, and, taking one thing with another, he is about as constantly employed as when he was Emperor of Brazil.

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WHO IS RESPONSIBLE?

The army gentlemen who earn brevets and distinction by residing in Washington, managing the clerical operations of the War Department, are reported to be "quite calm" in their contemplation of the Indian excitement that prevails about two thousand miles distant from their comfortable hotels and clubs. This ought to be reassuring to the whole community, for did not the same gentlemen—or others whom they have succeeded—extinguish the war of the Rebellion a quarter of a century ago from the same snug and cosey coverts? As a matter of fact, however, at this present writing it looks as though a bitter conflict is impending with the excited redskins in the Northwest—though probably the outbreak will be postponed until the approach of warm weather next spring. The attitude of the savages is the more threatening from the fact that it is based upon a religious frenzy that has been created in their untutored minds by some adroit and sinister agency, the true character of which has not yet been explained. But it must be borne in mind that this fanaticism, as the Chicago *Herald* points out, would not have reached so dangerous a point if the red men had not been rendered sullen and revengeful by the failure of the government to provide them with their usual supplies. Hunger is a powerful factor in making even a civilized man desperate, and it cannot be permitted to exist among savages with safety to the white settlers who surround them. If the Sioux had been well fed they would not have in condition to dance for hours at a time. Our Indian policy proceeds on the theory that it is better and cheaper to feed the Indians than to fight them, but there is a fatal weakness in its application. The men who must fight them in case of trouble have nothing to do with feeding them. That is wholly under the control of politicians, most of them the biggest knaves in the country. No other branch of the civil service has been so habitually and so hopelessly corrupt as the Indian bureau, and it is idle to look for substantial reforms while the present system continues. The only proper remedy lies in the direction of the abolition of that branch of the government and the placing of all nomadic tribes under the charge of the army. Such an arrangement would put an end to the injustice, the corruption and the wars that have characterized our Indian policy for many years. A powerful interest in the far West is always in favor of an Indian war. It brings men and money into the country and gives employment to many people who would otherwise be idle. The inefficiency and the corruption of the Indian bureau are ever instrumental in precipitating trouble. Yet the army must remain inactive and practically without influence until hostilities have actually begun. That these conditions are best calculated to provoke war and to make it peculiarly atrocious when once entered upon does not admit of question. The army not infrequently finds itself compelled to kill and be killed in a cause that it knows well enough is not a just or a necessary one. If the present excitement shall result in the adoption of a manifest and entirely feasible reform that will give the Indians wholly into the keeping of the army great good will come of it.

A SUMPTUOUS COOK BOOK.

The most sumptuous and expensive book on culinary art that the world has ever seen is the work of a French artist named Emile Bernard. So large is this volume that it will cover, even when closed, a moderate sized table. The illustrations, which adorn it throughout, are excellent representations of the various dishes treated of, each photographed full size by an expensive apparatus, constructed especially for the purpose. The letter press, the binding, the gilding, indeed everything in connection with this huge tome are most elaborate, and nothing that money can purchase seems to have been stinted. Only one hundred copies have been printed, and these are in the exclusive possession of crowned heads and their immediate relatives and friends, who subscribed for them. The total cost of producing this magnificent work was $75,000, thus bringing the price of each book to $750. The undertaking ranks as a fitting tribute to the distinguished profession to which it belongs, and also to the German Emperor, William I, under whose especial patronage it was begun in 1883. It certainly stands unrivaled as a cookery book, and, although invisible to the world at large, is perhaps the greatest monument ever erected to the gastronomic art. The author of this stupendous work commenced life at Dole, in Jura. Rising in his profession, he made his mark in Paris, when, as an assistant, he distinguished himself at the preparation of the banquets given in celebration of the marriage of Napoleon III. After this event he got an appointment to a Polish princess, with whom he remained some years, until he obtained the post of chef to the German Emperor, at a very high salary, with apartments assigned to him worthy of a prince. Here his duties only exacted from him a three months' alternate attendance.

PHONOGRAPHS AND FAMILY JARS.

We hear considerable speculation from time to time as to the possible useful functions the phonograph is to serve in social economy. Experiments are being made in this country to utilize them in counting-rooms, newspaper offices, courts, and many other places where exact and rapid reproductions are required of spoken language; but in Russia a new use for them has been suggested, in the extremest privacy of the family. A daily paper of St. Petersburg expresses regret that there are no phonographs for sale in Russia. "One of our correspondents," the editor says, "has found a use for the instrument of which its inventor has perhaps never thought. He writes us a touching letter, begging that we should tell him where to procure a phonograph, for which he is willing to pay any price that may be demanded. He has a scolding wife, who uses the harshest words and the most cruel expressions. When she is in a calm mood and he reproaches her for the language she has used, she either denies her words point blank, or so perverts his words as to impute to him the improprieties which she has committed. He therefore wishes to have a phonograph in the house, that the instrument may repeat to his wife her own scolding. Mr. Edison, if he could read the heart-rending story of our correspondent, would undoubtedly have pity on him and come to his assistance."

A HINT TO HOMŒOPATHS.

"The poison of the golden rod," says a writer in the New York *Evening Post*, "arises from a fluffy or powder-like substance which the flower produces as it begins to decay, which increases day by day and sends forth its poison around, entirely imperceptible, and the peaceful sleeper inhales it to such an extent as to lay him up for several days. In some respects the symp-

toms are not unlike la grippe. It irritates the throat, produces violent sneezing, makes the limbs feel as though burdened by a heavy weight, and depresses the patient to such a degree that he hardly cares whether school keeps or not." On the principle of *similia similibus curantur*, this seems to be a "proving" of the medicinal virtues of golden rod in the treatment of la grippe. It should be further tried.

BABYLON REPRODUCED.

THE TOWER OF BABEL TO BE REBUILT IN CHICAGO.

A reproduction of the famous Tower of Babel, as it stood in the great city of Babylon three thousand years ago, will be a feature of the World's Fair in Chicago. The Smithsonian Institution here is to supply the model, which will be constructed under the supervision of Dr. Haupt, the distinguished Oriental scholar, and upon his plans. Erected precisely on the scale of the celebrated original, it will ascend in seven diminishing stories, impressive from without, while its interior will be a museum exhibiting life and affairs as they were in the mighty empire of ancient Assyria, with the most remarkable assemblage ever got together of art works, books, and all sorts of other curiosities dug out of the vast mounds which now are all that remain of Babylon and Nineveh. Already a Washington architect has completed the plan and elevation of the model, ten feet in height, which will soon be in readiness for shipping to the Exposition, where it has but to be copied for enlargement. Final action on this matter has not yet been taken by the management of the Fair, but there is understood to be no doubt that the scheme as above outlined will be carried out. The intention is to construct the building, not of bricks, like the original tower, inasmuch as that would be too costly, but of iron, and according to the best methods of modern engineering. One disadvantage of ancient Babylonian architecture was that it was particularly unstable. The houses, palaces and temples, however magnificent and expensively built, being made of sun-dried brick, with burned bricks only for facing, always tumbled down within, at most, a century. Such was the fate of the Tower of Babel itself, though it was rebuilt at least once by Nebuchadnezzar. The city of Babylon, which had 2,000,000 inhabitants and covered about twice the area of London, stood upon an immense plain of clay very suitable for bricks, and there was no stone of any sort to be had. Myriads of slaves, toiling under merciless drivers, built the astonishing public works executed by the kings of Babylonia, just as was the case with the Pyramids of Egypt. Of all these works the most celebrated was the chief among the many superb temples of Babylon, the ruins of which have been designated by modern archæologists as those of the Tower of Babel. Although not more than 140 feet high, it seemed to the dwellers of the great Assyrian plain, where there were no lofty objects for comparison, to nearly touch the heavens, and it was said the tongues of men were confused in attempting to describe its wonders. Its actual height was considerably added to in effect by the fact that it was built, like all other important Babylonian edifices, upon a high artificial terrace. Still farther was it uplifted by a second platform of earth 600 feet square. From this upper platform the tower rose, its first story, 272 feet square and 26 feet high, faced with glazed brick painted black in honor of Saturn. To Jupiter the second story was dedicated, and the color belonging to that god being orange, it was of that tint—220 feet on a side and 26 feet high. The color of the third story was red, in compliment to Mars; each of its four sides was 84 feet and its height 26. Each of the last four stories was 15 feet high. The fourth story was 143 feet square and covered with thick plates of gold, being dedicated to the sun. White was the hue of the fifth story, out of respect for Venus, and it was 112 feet square. The sixth story was blue, Mercury's color, and each of its sides measured 76 feet. A cube of 15 feet formed the seventh story, covered with plates of silver, in honor of the moon. Dr. Haupt thinks that there was on top of the seventh story some sort of cupola or observatory for astronomical work, but this is not certain. The tower at the Fair will have to have windows of the ordinary sort, though one thing which Assyriologists of to-day have not been able to ascertain at all is how the buildings of Babylon were lighted. Such, at all events, was the Tower of Babel, considered the greatest architectural marvel of its age, stored inside with golden statues and other treasures of inestimable value. From this type of structure the Egyptian pyramid was originally developed, by simply filling in the slant between the stories so as to make each side a smooth descent, instead of a series of steps.

The Babylonians of three thousand years ago had already attained a high degree of civilization, and had developed the arts and sciences to a surprising degree. The astronomers were of no mean order, and much of our own mathematics comes originally from their study of the subject. Clay tablets have been found inscribed by them with problems in square and cube root, figured out. In astronomy they were proficient, though they utilized the science for astrological purposes chiefly. To them is credited the invention of the telescope. Each day the astronomer-royal made a report to the king of his observations of the preceding twenty-four hours regarding the movements of the planets. Many of these reports, written on clay, have been discovered. One feature of his report was the amount of rainfall, and thus become known to moderns the existence of the earliest weather bureau. The priests were the astronomers of Babylon, and they drew signs and portents from the skies for the benefit of the people. Babylon had a great university, schools and libraries. All the books in the libraries were stored away in jars, because they were not printed on paper, but inscribed with a stylus upon moist clay tablets, which were subsequently baked hard. The stylus used for writing had its sharp end three-cornered, so as to give the best point, while its other end was blunt and flat, to serve as an eraser. With this instrument also all documents of whatsoever sort were written, and business agreements of all kinds executed in Babylon five thousand years ago are extant now, including bills of sale, marriage contracts, receipts for payment, and so forth. It is not known that the Babylonians used any money save gold and silver weighed out. The men of Babylon all carried walking-sticks, and it was the law that each one of these canes should have a head with a special device belonging to its owner. Sometimes these devices were used for seals, but ordinarily the seals which every gentleman carried were worn around the neck or on the finger, attached to the wrist or fastened to the garments. Originally these seals were simply carried about as amulets, with the notion that they kept away diseases and evil spirits; but subsequently it became the fashion to use them somewhat as seals are used at this day, and it is from this source, in fact, that we got our notion of the seal at the beginning. Usually the Babylonian seal was in the shape of a little cylinder of agate or some other semi-precious stone. After a citizen had signed a business document, for instance, he would roll his seal across the soft clay at the bottom of the tablet, and so make the document binding. Illiterate and impoverished persons would press their thumb-nails upon the margin of the clay, just as the uneducated make their marks nowadays, instead of writing their signatures. The earliest form of the modern printing press is found in the cylinder seal of Babylon. Gentlemen of Babylon were accustomed, by way of costume, to wear a long muslin shirt, with a woollen tunic outside of it, for out-door. The garment worn by the ladies was of the simplest nature, and exposed one of the breasts.

The city of Babylon was built in the form of a square. It was surrounded by a wall fifty-five miles long, and this wall was, throughout its entire extent, 350 feet in height, or two-thirds as high as the Washington monument, and 87 feet thick. It was constructed of burnt bricks, and half a dozen four-horse chariots could be driven abreast along its top the entire circuit of the city. Outside of this mighty wall was an encircling ditch of corresponding width and depth, the clay dug from which was used to build the wall. Also there was an inner wall, not so thick as the outer one, though in itself an impassable barrier against any foe. Through the midst of the town the river Euphrates flowed, its banks on either side strengthened against floods or the invasion of hostile troops by similar gigantic walls of brick. On the west bank of the stream was the palace of the king, the terrace on which it stood measuring eight miles in circumference. The palace of the old kings of Babylon was on the opposite side of the river, its own terrace only four miles round about, and the two were connected by a superb ornamental bridge. When the great brick quays guarding the Euphrates were constructed—themselves representing one of the most astounding engineering feats known to history—the Euphrates was actually drained off for the time being into an artificial reservoir 160 miles in circumference outside of the city, and the bed of the stream was paved with bricks. Then the river was turned back into its course, the reservoir being thereafter maintained for purposes of irrigation. The streets, running parallel across the city, opened upon the Euphrates on each side by twenty-five gates of brass, which were let fall at night like so many portcullises, no one being let through them after sunset save by the order of the governor or the king. In the daytime ferry-boats plied across between the gates at each of the intersecting streets. Canals flowed through Babylon in every direction, as they do in Venice. Though containing two million inhabitants, Babylon was not closely built up, like London or Paris, but the houses of the city were much scattered, and parts of the town had a semi-suburban aspect. Great areas of pasture land also were included within the walls, so that the city could well-nigh support its inhabitants by the produce of its own rich acres. When Cyrus, King of Persia, laid siege to the city, in the sixth century before Christ, Babylon was provisioned for twenty years, and could undoubtedly have held out for an indefinite period had it not been for the carelessness or treachery that gave the foe an entrance. The most extraordinary architectural work of Babylon before its fall was the Hanging Gardens, which King Nebuchadnezzar erected for his wife, Amytis. Southern Syria is a region of most infernal heat in summer, inasmuch as it is a level plain and the climate semi-tropical. And thus it was that Nebuchadnezzar undertook the task of building for his royal bride a sort of terraced garden, far above the level of the earth. It was an artificial mountain, 400 feet in height, and reared with terraces resting upon columns, the whole bound together by a wall 28 feet thick. On the uppermost terrace were reservoirs for irrigation,

supplied with river water by an engine worked by slaves. The terraces thus laid upon columns were overlaid with earth to a depth sufficient to support the largest trees, and artificial streams, with fish in them, flowed along the terraces, descending from one to another in miniature cataracts. When Cyrus sat down before the city to besiege it, the Babylonians laughed at him. They had provisions enough to last them twenty years, and they knew that all the strength of the Persian army could never get through their impregnable walls.

Unhappily the Babylonians had a weakness for going on periodical sprees. On the night of the capture King Belshazzar was personally conducting a most gigantic jamboree, in which the whole metropolis was joining with enthusiasm. The guards were careless, and Cyrus took the opportunity to drain off the Euphrates into the distant artificial lake. Then he marched his soldiers into the city along the bed of the stream, and finding the river gates open, proceeded to the very door of the palace, where an orgy was progressing. Belshazzar came forward, sword in hand, and was slain.—RENE BACHE, in Boston *Transcript.*

STANDARDS OF MEASUREMENT.

THE CARE TAKEN FOR THEIR PROTECTION.

The collection of standard weights and measures preserved in the fireproof building of the Coast and Geodetic Survey, in Washington, is described by a correspondent of the *Scientific American.* Many of them are now of purely historical interest, the more recent ones only being accepted as absolute standards. Among the weights are the cruder forms originally used in this country as standards. Three are of special interest. One, which is nearly cylindrical in shape, with a slight groove around its upper part, is known as the gilt pound, and it represents the British unit of weight. "The committee kilogramme" is a brass weight, and is one of a number made at the same time under the charge of the French committee that, near the end of the last century, established the original metric standards of measurement. Its true weight was within one-half milligramme at the furthest. It is a cylinder fifty-three millimeters in diameter, the height being equal to the diameter. The committee had a peculiar stamp, which consisted of an ellipse, supposed to represent a meridian section of the earth, with three quadrants shaded, and with the figures 10,000,000 marked within the unshaded quadrant near its outer perimeter. That stamp is impressed on the bottom of the kilogramme. The metal now has minute holes. A weight known as the Arago platinum kilogramme is cylindrical in shape. Albert Gallatin, when Minister to France in 1821, procured it. In 1879 it was compared with the British platinum kilogramme, and its specific gravity was determined by Chaney. In 1884 it was taken to Paris for comparison with the international standard. The national prototype kilogramme is kept under a glass case. It was constructed by the co-operation of the principal governments of the world, as represented by delegates, at a convention in Paris in 1872. The standard metres and kilogrammes established by them were reproduced and distributed by lot in 1889. The reproductions are termed national prototypes. For the preservation of the original international prototypes a subterranean vault has been provided in Paris to protect them from accident, and against any sudden or great change in temperature that might cause a change in the molecular structure of the metal. Three different keys to the locks of the vault are under the charge of three individuals. The American national prototypes are to be preserved with similar precautions in Washington. The kilogramme is of a standard alloy of 90 per cent. platinum and 10 per cent. iridium, with a tolerance of 2 per cent. in excess or deficiency. The form is that of a cylinder, with slightly rounded edges, its height being equal to its diameter. The national prototype metre is of the same alloy as the kilogramme. The bar is 1.02 m. long. The ceremony of breaking the seals of the prototype meter and kilogramme took place at the White House, in the presence of President Harrison, Secretary Blaine, Secretary Windom, and a distinguished company, on January 2, 1890. The departments were represented by officials, who signed a memorial to the effect that they had witnessed the ceremony. The standard yard, as supplied by the Government to the States, consists of the yard proper and a template that protects the terminal points. The Troughton scale, bearing the maker's name, and dated London, 1814, was made for the use of the Coast Survey of the United States. It is a brass bar with an inlaid silver scale. It is 86 inches long, 2½ inches wide, ½ inch thick. The strip of silver down its centre is inlaid flush with the brass, and is a little more than one-tenth of an inch wide. Two parallel lines are ruled on the silver longitudinally, being about one-tenth of an inch apart. Starting at about 3.2 inches from one end of the bar, the graduations begin, and the silver strip is divided for its lengths into tenths of inches. As a standard of reference the interval between the twenty-seventh and sixty-third inches of that scale has been adopted. That part corresponds to the mean of the whole scale, and has been compared with other standards. The yard and ell bed-plate made by Thomas Jones, instrument maker for the Honorable Board of Ordinance, &c., of Great Britain, bears the impression of the exchequer stamp. Two grooves run longitudinally along the bar, with stops at the ends. The length between one pair of stops is supposed to be a yard, and that between the other pair an ell. It was made in the early part of the present century. The copies of the British standard yard are of bronze and iron, and were presented to the United States by the British Government in 1856. Each bar is one inch square in section and thirty-eight inches long. At each end are wells a half inch in diameter and sunk a half inch below the surface, thus reaching the medial plane. In the bottom of each well is a gold pin one-tenth of an inch in diameter, on which are drawn three traverse and two longitudinal lines. The yard is the distance from the centre of one middle traverse line in one well to the corresponding point in the other well. Covers are provided for the wells in order to protect them from dust. The iron yard is of Low Moor iron. They are inscribed in each case with the temperature at which they are supposed to be standard. 61.79 deg. Fah. for the bronze bar, 62 58 deg. Fah. for the iron bar. The committee metre, the standard of the French committee in 1799, is one of fifteen similar bars made at that time, and was brought to this country in 1805. It is a plain iron bar 29 mm. wide and 9 mm. thick. It is an end measure, the entire cross section of the bar being designed for abutting surfaces. It is stamped with three dots as a designating mark, and also has the shaded ellipse. In a glass case are various standards of measure and weight. The measures of capacity are fitted with glass plate covers for sliding over the accurately ground edge of the metal to secure absolute fulness. A set of United States coin weights, troy ounces, &c., are also preserved. All these standards are kept in a room which is dark and dustless.

OATMEAL SUPERSTITION.

FOOD THAT TENDS TO STARVATION.

The breakfast awakens curiosity. First comes oatmeal—pasty, inferior stuff—ill-cooked, fit perhaps for a ploughman or shepherd who works his food off by hard labor in an open air all day, but very far from the food for a slender, nervous girl or boy at school. The oatmeal superstition is a hard one to uproot in the minds of house-keepers, who have made it a part of their routine and hate to take up anything else. Farmers do not feed oats to their horses unless they are hard at work, because the grain is too heating for them, and breeds disease in animals unless thrown off by vigorous muscular effort daily. Oatmeal, especially of the finer sorts in which the house-keeper delights, often passes digestion in a crude shape as masses of starch, which clog the body without nourishing it. Dry, crisp oatcake is much better taken than dry oatmeal, and is far more palatable, its oil and starch being changed in baking. Clean cracked wheat is the food for the nervous, studious or house-keeping women and children, containing as it does the phosphates needed and the coarse character which aids the organs in their work. The fine flours and foods of the day are one great cause of the early deterioration of the race. If we wished artfully to eliminate every particle of nutrition from food, it would be only necessary to carry the process of grinding, bolting and refining a little further. In my experience, and that of the most intelligent literary people met, it is not possible to change from sound coarse food, containing all the wheat, for one day, without loss of strength and nervous tone, while the difference in complexion in a single month challenges admiration from all the women about. The men don't say anything, but they notice it all the same. I know that ordinary women scout and cavil at this doctrine. They will have it that their mothers were strong and good-looking on white bread and fried potatoes and steak, and it is all nonsense to fuss so much about cracked wheat and coarse bread when they are just as well without it. They send to the bakers for bread five days in seven, and put their oatmeal to cook for the breakfast opening course to be swilled down—there is no other work—with milk and sugar just before the beefsteak or the ham and eggs. Oatmeal paste, half cooked, city milk and sugar! Why not serve ice cream before the meats? Let the wheat, carefully cooked the night before, be served with the juicy steak. The general habit of flooding the stomach with milk and sweets arrests digestion at once and impairs the value of the food taken after. All these things tend to the early drooping and decay of the human flower. Our women are half starved, to tell the truth.—*Shirley Dare.*

BENIGHTED BARBARIANS.—The one part of the world in which no native pipes and no native smokers have been found is Australia.

CHEMICAL TRUST.—The great chemical trust in England has been registered as the United Alkali Company with a capital of $30,000,000 in $50 shares.

ANOTHER CLAIMANT.—The French are not going to let Dr. Koch have all the glory of discovering a consumption cure. Last week Dr. Letulle delivered to the Academy of Medicine a sealed package containing the account of his labors in discovering a remedy for consumption. Dr. Marquezy was his collaborator.

HOW TO OBTAIN A SPARK.—A very simple apparatus for obtaining an electric spark is made by a German physicist. Around the center of a common lamp chimney is pasted a strip of tinfoil, and another strip from one end of the chimney to within a quarter of an inch of this ring. Then a piece of silk is wrapped around a brush, and the interior is rubbed briskly. In the dark a bright electric spark may be seen to pass from one piece of tinfoil to the other each time the brush is withdrawn from the chimney. Many other experiments can be tried with this apparatus.

THE TABLE D'HOTE.—The popularity and cheapness of California wines are swelling the number of table d'hote or "maccaroni" restaurants week by week in this city. Before the caterers knew that they could use native wines they paid a dollar and a half a gallon for a sour and bitter French ordinaire claret. They now serve a fruity California wine that costs only fifty cents a gallon and pleases everybody better. The spaghetti, which forms the other main attraction at these dinners, is only a flour paste which, whether it is made in this country or in Europe, costs very little. The true way to cook it is to boil it in rich beef stock and then mix it with stewed tomato, but as beef stock is the costliest staple in the restaurant business the spaghetti is often boiled in water and served with thin tomato stew and grated cheese. On these two features, claret and spaghetti, hang all the cheap table d'hote dining places in town.

GOLD.

ITS PROPERTIES SCIENTIFICALLY CONSIDERED.

Gold has been known from the earliest time, and has always been considered the king of metals. Its beautiful color, its malleability and ductility, and its power of resistance to oxidation and other chemical changes has given it a high order in the arts, while the same qualities, added to those of a limited but constant supply, and the high cost of mining and extracting it from its ores render it particularly well adapted for coinage, and to serve as a universal standard of value. Gold is almost invariably found native, or in the metallic state, the few specimens of telluride of gold observed having only a scientific interest. It occurs either in the primitive rocks or in the celluvial deposits formed from the destruction of these rocks, and washed down from higher to lower levels. A minute trace has been found in sea water in certain localities, but in too small quantities to pay for extraction. It has a very strong affinity for mercury, uniting with it to form a liquid amalgam, from which it can be separated by heating to the boiling point of mercury, which passes off in vapor, leaving the pure gold behind. This process is very largely used in the separation of minute particles of the metal from the rock in which it occurs. Pure gold is so soft that it would soon be worn away by use, and it is always alloyed with a varying proportion of copper or silver, usually about one-tenth. Pure gold is said to be 24 carats. Thus, 18-carat gold contains 18 parts of the pure metal in 24, or is three-quarters pure. Many cheap alloys of base metals can be made which very strongly resemble gold in color and lustre; but in the absence of a complete chemical test, the high specific gravity of gold (19.3) is the best test of its purity, though this has been ingeniously imitated by covering the heavier but cheaper metal, platinum, with a layer of gold. Iron pyrites and other yellowish minerals are constantly being mistaken for gold by inexperienced persons, much to their disappointment, but a very simple test will show whether a doubtful specimen is really the true metal. Gold is very sectile—that is, it can be cut and shaved with a knife, like a piece of wood or horn, while pyrites and other worthless minerals will crumble under the knife blade like a lump of sugar. If any reader of this article ever finds a yellowish mineral which can be cut without crumbling, it is worth a more thorough test. Otherwise he may as well save himself unnecessary trouble and disappointment. Very few chemicals have any effect on gold. Selenic acid will dissolve it, but few chemists have ever seen this very rare substance. A mixture of nitric and hydrochloric acids (*aqua regia*) will also dissolve it, forming a chloride of gold, and so will a solution of chlorine gas in water. In both of these liquids a peculiarly active form of chlorine, known as nascent chlorine, is present, which probably unites directly with the metal. Gold, like all the noble metals, is unchanged by heating in the air. Its oxides can be obtained by chemical reactions, but they are very unstable, and easily reduced back to the metal. The chloride above referred to is the only salt of any practical importance, and is used to produce the beautiful Purple of Cassius, a compound of tin and gold of uncertain composition, but yielding a magnificent ruby color when melted into glass. A hundredth of a grain of gold will deeply color a cubic inch of glass. The most extensive use of the chloride is, however, in photography, where it is used to "tone" or color prints on silvered paper. This darkening of the prints is due to the decomposition of the salt, and the deposition in the picture of finely-divided metallic gold, which not only gives it the desired color but renders the image very permanent. By beating out between pieces of membrane gold may be formed into leaves of such thinness that 282,000 of them will only make a pile one inch in height. A single ounce of gold may thus be spread over one hundred square feet. In the manufacture of gold thread for embroidery, a cylinder of silver is covered with gold, and afterwards drawn out into wire. In this way six ounces of gold have been made to yield over two hundred miles of gilt wire. Even at this extreme tenuity the coating is perfect, and does not rust or tarnish. The thin leaves of gold mentioned above have the familiar yellow color by reflected light, but are partially transparent, and by transmitted light show a green or blue tint. If gold leaf adhering to glass is heated to the boiling point of oil for some time, it will become quite transparent and invisible by transmitted light, though still showing the usual golden color by reflection. When gold is deposited on glass by an electric spark, the finely-divided metal transmits ruby, violet or green light, according to the thickness of the deposit, though reflecting the usual yellow metallic lustre. Bromide of gold has lately been used to some extent in medicines, but it probably has no particular advantage of the other salts of bromine, while the high cost would always form an objection to its general use. A quack remedy said to contain gold has been advertised as a cure for drunkenness, but an analysis has failed to detect the precious metal, which, even if it were present, would have no such effect as is claimed for it. Taken in considerable quantity, the salts of gold are said to be distinctly poisonous. From the time of the alchemists the artificial production of gold by transmutation from other elements has been a favorite pursuit of mankind, and even at the present day there are probably a few unbalanced persons engaged in the quest of the "philosopher's stone." It must be admitted that the tendency of modern chemical thought is towards regarding the different elements as either compound bodies or different forms of one primitive material substance; but whatever may have occurred in the early ages of the universe, or whatever may be the true condition of matter at the present day, not a single fact has ever been observed which would indicate the possibility of changing one so-called element into another. And while we cannot say with absolute certainty that lead, for instance, can never be changed into gold, the improbability of such a transformation is so great that we may place it beyond serious consideration; and until further investigations open up avenues of research at present unknown to us, we must be content to laboriously dig out of the ground the stores of the precious metal that nature has supplied to us ready made, and shall search unsuccessfully to repeat transformations of matter, which, if they ever took place, occurred at so early a period in the history of our universe that the human mind is unable to comprehend the number of years which would indicate its remoteness in time.—*Popular Science News.*

HEADACHE AND EYEACHE.

THE CAUSE AND EFFECT OF STRAINING THE EYES.

Eye strain should be the first thought suggested by any complaint of headache, for in our day and civilization it is by far the most common cause of that symptom. It enters as a factor into the causation of nearly all headaches not due to pyrexia, toxæmia or diseases of the brain or its membranes. The simple existence of headache, therefore, should suggest eye strain, but frequently a careful inquiry as to the manner and time of occurrence of the attack and the location of the severest pain will be almost conclusive as to the origin of the trouble. Often it comes on whenever the eyes are used, and is absent when the eyes have had a proper season of rest. The occasions of most severe requirement in the direction of eye work are the doing of anything requiring accurate near vision, taxing both the accommodation and the convergence, or traveling, shopping, attending at public gatherings, which entail more use of the eyes than the patient is at the time conscious of, and often under unfavorable conditions. In hyperopia in young people, the accommodation is in excessive use so long as the eyes are open and the attention fixed on any visible object, and hyperopia is the most common cause of constant headache. The writer was formerly subject to a constant headache whenever confined to the house, and regarded it as caused by breathing vitiated air, until it was quite cured by the correction of his hyperopic astigmatism. Many persons have the same idea as to the causation of the headaches they always experience when attending the theatre or other places of public amusement, and which are really due to eye strain. Others ascribe these headaches, and those experienced in traveling and shopping, to exhaustion. This is nearer the truth, only they commonly have in mind a condition of general exhaustion, whereas it is largely one of local exhaustion of the special nervous apparatus concerned in the act of seeing. Congestion, irritability, or inflammation of the eyes and their appendages, should always suggest the suspicion of eye strain. A single attack or manifestation of this kind has no special significance, but repeated attacks of inflammation, or prolonged congestion, or irritability are exceedingly suggestive of a continuing cause, and the most common of these is the one now under discussion. No case of chronic inflammation of the margins of the lids, or of recurring conjunctivitis, or repeated sties, has justice done to it until it has been carefully investigated for eye strain. Persons at the period when they begin to feel the effects of the loss of accommodation in presbyopia or absolute hyperopia suffer from repeated attacks of conjunctivitis, which they commonly ascribe to "taking cold in the eye," but which are cut short by use of the appropriate lenses, and which, if unchecked, would tend to establish a chronic catarrhal condition, which is a chief discomfort in the lives of many people. I should like, also, adds the editor of the *Times and Register*, in a recent issue, to call attention to car sickness in connection with eye strain. I have had eight or nine cases of this kind, all of which were relieved by glasses. One case was that of a gentlemen who every journey had car sickness. While he had the mydriatic in his eyes he went to Washington, and suffered no inconvenience whatever. Subsequently, after he had glasses, he made a trip to St. Paul without any of the former trouble. Recently I have had two cases—one that of a girl who could not ride a short distance in the street cars without vomiting. I found a decided degree of hyperopic astigmatism. With the mydriatic in her eyes she rode home without her usual trouble. A strange thing with reference to eye strain is that often exists to an exceptional degree without showing any symptoms in the eye. The patient will often say that the eyes are perfectly good and have never caused any irritation. The reflexes seem to have settled in some other place. This an interesting pathological and physiological question.

ANCIENT ART.

EXTRAVAGANT COST OF SOME STATUES OF ANTIQUITY.

The famous Colossus of Rhodes was made of bronze and was seventy cubits (or about one hundred and five feet) in height, was twelve years in making, and is said to have cost only 300 talents, or about £75,000, if we reckon the Attic talent, or £102,000 if we reckon the other talent, and probably the latter talent is to be reckoned in this case. At all events the so-called Colossus of the Sun, in the Capitol, which was a bronze figure of Apollo, only thirty cubits (or forty-five feet English) high, brought by Marcus Lucullus from Appolonia, in Pontus, cost 500 talents, which, if reckoned even in Attic talents, would be over £125,000, and it would hardly be probable that the Colossus of Rhodes, which was twice its height, could have been executed for so much less. But this is a trifle compared to the price for a colossal statue of Mercury, made for the city of Averni, in Gaul, by Zenodorus. On this work he was engaged for ten years, and the cost of it was £335,000. What the gold and ivory Athena of Phidias, in the Parthenon, or his Zeus at Olympia cost, is not stated by any ancient author. The gold employed on the movable drapery alone of the Athena was over forty talents in

weight of unalloyed gold, according to Thucydides, whose exactness in such matters is above suspicion. This would be equivalent to some £116,000 in coin, while a single lock on the head of Zeus at Olympia weighed six minæ, or about the value of nearly £5,000. For the famous statue of Diadumenos, which was a bronze figure of life size, representing a youth tying a fillet round his head, Polycleitus received 100 talents, or about £25,000.—*Blackwood's Magazine.*

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

December.

MEATS.—Beef, mutton, pork, venison, veal.

POULTRY AND GAME.—Chickens, fowls, ducks, geese, turkeys, grouse, capons, hare, partridge, pheasants, rabbit, pea-fowl, guinea-fowl, snipe, widgeon, wild duck, woodcock.

FISH.—Brill, carp, cod, crabs, perch, salmon, smelts, soles, sprats, tench, turbot, whiting, halibut, sturgeon, oysters.

VEGETABLES.—Jerusalem artichokes, beets, broccoli, cabbage, carrots, celery, endive, winter spinach, eschalots, turnips.

FRUIT.—Apples, oranges, bananas, nuts.

PRACTICAL RECIPES.

CRAB SOUP.—Take out the meat from one dozen large crabs and remove the dead men's fingers and the fat. Put in a large stew-pan one tablespoonful of lard, one of butter, one large onion, quartered; one clove of garlic, and allow them to brown, then add one can of tomatoes and stew for ten minutes; add the crab meat; season with salt, black and read pepper, rind of a lemon, one tablespoonful of the juice, sift over all six grated soda crackers and add enough boiling water to make sufficient soup for twelve people and allow it to boil gently for two hours. A little before serving add the fat from the crabs and a little thyme, parsley and sweet marjoram.

CLAM PIE.—Chop fine one quart of hard shell clams, add to them two tablespoonfuls of butter and a cupful of cream; season with pepper and salt and bake in rich paste.

SPICE CAKE.—One cup of butter, one cup of sugar, one cup of molasses, half a cup of sour milk, one teaspoonful of soda, three eggs, four cups of sifted flour, one teaspoonful each of ginger, cinnamon, cloves and mace. Citron, currants and raisins may be added if desired.

PUMPKIN PIE.—Cut a pumpkin into small pieces and stew until tender, mash it through the colander and measure it; then to every pint of pumpkin add one pint of milk, a large tablespoonful of butter, a little salt, one teaspoonful of ginger and half a teaspoon each of cinnamon and mace, four eggs and about a cup of sugar. Make a light crust of one quart flour, one half large cup of butter and one half cup of sweet lard, one teaspoonful of salt, the white of an egg and ice water. Put the flour on a large dish or slab of marble, make a depression in the centre and put in the salt, egg and a lump of butter; work these well into the flour, add sufficient water to make a stiff dough, roll out, spread over it the rest of the butter and lard, fold up and roll until the butter is soft, then let it get cold and repeat the operation till the butter is thoroughly worked in. Line a deep pie-plate with this, fill with the pumpkin and bake to a rich brown.

RICE DUMPLING.—Boil, drain and mash slightly one half pound of rice; add then two tablespoonfuls of butter, three tablespoonfuls of sugar, one quarter teaspoon of mixed cinnamon, cloves and allspice, salt, and the yolks of two eggs; moisten with two tablespoonfuls of cream; roll into balls with the hands, tie them in cloth and steam for forty minutes; serve with custard sauce.

CUSTARD SAUCE.—Mix together four ounces of sugar and two ounces of butter (slightly warmed). Beat together the yolks of two eggs and a gill of cream; mix and pour the sauce in a double sauce-pan; set this in a pan of hot water, and whisk thorougly three minutes. Set the sauce-pan in cold water and whisk until the sauce is cooled.

APAQUINIMIES.—Yolks of two eggs, one pint flour, one-half pint milk, two teaspoonfuls butter, a little salt; roll very thin like wafers, and bake.

IMAGINATION AND REALISM.

HOW THE NOVEL BRINGS DIFFERENT CLASSES INTO SYMPATHY.

There is something pathetic, not wholly sad, in the thought of the poor boy or girl who finds delight in fictitious annals in high life. Boy and girl put themselves respectively in the place of hero and heroine. They are richly dressed, and in marble halls they taste the sweets of elegant leisure, of power and praise. "Nothing is either good or bad but thinking makes it so," and imagination has no cage. Poverty is beguiled of its sting, toil is lightened, and ennui gives way to a round of noble pleasures and dramatic scenes, until the curtain falls upon baffled villainy and triumphant virtue. Those humble readers are not troubled by the doubts and cavillings of the exacting realist. They are happy in that they can take so much for granted. If they have not had the real thing they think so, and so far as they are concerned is it not all the same? But high life would know low life, too. Scholars and courtiers like Virgil and Horace were in love with pastoral scenes and rustic pleasures. Marie Antoinette would be a dairy-maid, and her royal husband would be a locksmith. In her palatial home the proud beauty grows weary of the rolling hours, overburdened as they are with the requirements of an artificial society and a perfunctory courtesy. The millionnaire, outworn with the care of his wealth, looks longingly back to the simple labors and untroubled sleep of his youth. The statesman, weighed down with responsibility and beset by importunate suitors for favor and influence, has pensive, regretful moments, in which he reflects that even a gratified ambition may have cost too much. Imagination brings surcease of repining, temporarily at least, to all of these exalted personages. The democratic novel, the romance of low life and of common life puts the great in touch with the masses of their kind, and makes sympathy possible between the loftiest and the lowest station. We live in many and different worlds in reality; we meet and mingle with each other in imagination. When we speak of civilization, of enlightened society, of progress, we have in mind a comparatively small part of the human race. "Scratch the skin of a Russian," said Napoleon, "and you will find a Tartar." But how much of our civilization is more than skin deep? In the great cities of Europe and America do we not find a barbarous population just beyond the purlieus of wealth and fashion, which only the fear of the constable keeps in check? Is ignorance more dense or vice more shameless in any quarter of Peking or Hankow than in the slums of New York and London? Do we need to go upon long journeys or to turn back the pages of history to find the lowest depths of human degradation? But what do we know of those people in their filthy hovels and noisome tenements? What sympathy, what tie of human brotherhood, what sense of fellowship exists between the cultivated and comfortable few and the benighted millions of the hopeless poor? We cannot paint a picture with mere statistics. What signifies a unit more or less in the grand total of human depravity and misery? We must knock at the doors of poverty and sin; we must look into the eyes of suffering and lift the burdens of the heavy-laden before we can really know the worst of what is called low life. Well, in our day the literature of imagination has essayed that sad task. The novelist goes now where none but the doctor and the most zealous philanthropist have ever gone before upon a mission of charity. So far as he dares, he paints the picture of that underworld to the life. He is not so humorous as Dickens, or so satirical as Thackeray; but he tries to be severely accurate in the delineation of every detail, and he brings to his work the artist's eye and the surgeon's nerve. He does not need to write the moral down in plain black and white. As the sightless eyes of the blind and the maimed limbs of the cripple tell their own story, and make a mute appeal to every generous heart, the squalid surroundings and sordid struggles he depicts speak loud words of warning and command.—*New Orleans Picayune.*

HEART FAILURE.

There is a certain element of humor in the habit of modern physicians, who, when they are unable to exactly determine the cause of a man's death, charge it to "heart failure," and then look round about them as though they were miracles of wisdom. In one sense, all death is the result of heart failure, for whenever that wonderful pump ceases its untiring strokes dissolution has come. But to apply the term in the slipshod sense now so much in vogue, is unworthy the noblest of all professions. True heart failure occurs only in those cases when the blood is so impure as to no longer supply the muscular tissues of the organ with the energy required to keep it in motion. The importance of this supply of force is easily appreciated when it is recalled that the blood, after being aerated in the lungs, and in its best possible condition, goes directly to the heart, both within and without, before being used for any other purpose. The amount of force consumed by the heart in its unending work is far up in foot-tons. The mere pumping of an amount of liquid equal to the blood in the circulation would involve a large quantity of labor. When to this is added the force requisite to overcome the friction and capillary attraction of the blood in the capillaries and lung cells, the sum total seems utterly disproportionate to the size of the muscle, for the heart is naught but a muscle, which does all this work. Nor should it be forgotten that there is no rest nor recess from birth to death. When the blood becomes charged with humors it cannot convey force in the same manner as when it is pure and clean. As life must be kept up, nature has to choose between two alternatives. Either the heart must have a larger supply, and in that instance must work faster and harder, or it must content itself with what it receives and do less and poorer work. In either case there is danger ahead. In the former the additional work thrown upon the organ increases the wear and tear and tends to produce organic fatigue. If the increase be fifty per cent. it is equivalent to making the heart do twelve years' work in eight. Probably every reader has noticed that the hearts of strong, healthy men beat more slowly than those of sickly irritable people. As the strain continues the crisis approaches. Finally a point is reached at which the destructive and constructive forces do not balance and the machine stops. This is a genuine heart failure. It is too often incorrectly charged to over-exertion, over-exhaustion, intense passion or excitement. These may be the occasions; the proximate cause is the long continued overworking of the heart, and the real primary cause the contamination of the blood, and the accumulation of impurities in all the tissues of the system. To call the trouble merely heart failure under these auspices is excusable, but is using the name of the effect and not the cause. On the other hand, when the heart accepts what it receives, there is not enough force generated for it to do its work properly. Less blood is sent through the system, which in consequence is capable of

smaller exertion. The tissues dwindle and lose their strength, even the heart itself finally yielding and becoming weak and impaired. The impairment may be organic or local, affecting the valves. Here the crisis approaches, as in the other case, and only in this instance it is weakness and deterioration where before it was fatigue and wear—the result, however, is the same—a sudden strain and the mechanism stops. To prevent heart failure keep the blood pure. Where it is contaminated use Ayer's Sarsaparilla, and so expel every humor from the human organism. It is not a specific for cardiac diseases; it is not even a secret compound. It is a simple scientific preparation of sarsaparilla, podophyllin, yellow dock and stillingia with the iodides. These are Nature's own blood purifiers and so have been known for centuries. In Ayer's Sarsaparilla they have been skilfully combined, so as to retain in compact form the virtues of each and every ingredient. Used properly, there is no fear of heart failure in the least.

She had sent off, says the Philadelphia *Times*, a telegram, and was waiting for an answer. Suddenly the peculiar halting click of the receiving machine sounded in the office, and she said to her companion, "That's George, I know; I can tell his stutter."

Natural Mistake.—"Gimme a ham sandwich!' shouted the guest at the dime lunch counter. Two seconds later he complained to the attendant: "That was the worst sandwich I ever had. No more taste than sawdust and not big enough to see." "You've et yer check," replied the attendant contemptuously; "this here's yer san'wich."—*Puck.*

Annealing Steel.—A new way of annealing small pieces of steel is given by a writer in the *English Mechanic.* Heat the pieces as slowly as possible, and when at a low red heat put between two pieces of dry boards and screw them up tight in a vise. The steel burns its way into the boards, and, on coming together around it, they form a practically air-tight charcoal bed. When it cools off, the steel is apt to be found thoroughly annealed.

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CONTENTS.

JOURNALISTIC TRAINING.

Bacon's aphorism regarding the influence that the habit of writing out one's ideas exercises in making men "exact" is constantly verified in the newspaper profession. The facility of expression which some of the contributors to the editorial columns of the daily press acquire through practice is often, and justly, a subject of wonderment to men whose vocations do not necessitate the incessant daily transfer of thought from brain to paper. The Rev. Edward Everett Hale recently said that he believed he had done everything which an editor or publisher ever has to do, from directing wrappers up to writing the biography of the president within an hour after his death. This means, if the training be continued through many years of life, and if one be under a good chief, that one gains, of necessity, the ready use, at least, of his own language. "We newspaper men," Mr. Hale continued, "may write English very ill, but we write it easily and quickly. So that to us, who have been in this business, there is something amazing to hear a clergyman say that he occupied a week in composing a sermon, which was, at the outside, thirty-five hundred words in length. One can understand absolute inability to do it at all; but no newspaper man understands how a man, who can do it, can spend thirty-six hours in doing it. If you have to send "copy" upstairs, hour after hour, with the boy taking slips from you, one by one, as they are written, and you know that you are never to see what you write until you read it the next day in the paper, your copy will be punctuated carefully, written carefully, and will be easily read, That is one thing. Another thing goes with it. You will form the habit of determining what you mean to say before you say it, how far you want to go, and where you want to stop. And this will bring you to a valuable habit of life—to stand by what has been decided. Napoleon gave the same advice when he said, 'If you set out to take Vienna, take Vienna.' For these reasons, I am apt to recommend young men to write for the press early in life, being well aware that the habit of doing this has been of use to me."

HYPNOTISM IN BELGIUM.

The disfavor with which indiscriminate or unchecked tampering with hypnotism is viewed by European governments, to which we have previously referred, is further shown by a law passed by the Chamber of Deputies of Belgium last September. This law declares that "any one exhibiting a hypnotized person will be punished with imprisonment for from fourteen days to three months, and a fine of from twenty-six to one thousand francs. Any one not medically qualified who shall hypnotize a person under eighteen years of age or a person not of sound mind, shall be punished with imprisonment for from fourteen days to one year and a fine of from twenty-six to one thousand francs, even though the hypnotized person be not used for exhibition. Any one who, with fraudulent intention or with intent to injure, shall permit a hypnotized person to write or sign a document containing an agreement, making a disposition of property, entering into a contract, granting a release or containing any declaration, shall be punished with imprisonment. The same punishment applies to any individual who shall make use of any such document.

SHOPPING BY PROXY.

A business that has grown to extensive proportions in New York city, within the past few years, is that of purchasing agent for out-of-town buyers. Ladies of excellent social standing adopt this means of adding to their incomes, and there are several who make from one thousand to three thousand dollars a year at it. Nearly all retail merchants allow liberal commissions to purchasing agents, and in addition they will send samples of goods free of charge to any person recommended by a purchasing agent. Ladies who have succeeded as purchasing agents are usually experienced and expert shoppers. Circulars are sent all over the country every spring and every fall by the New York ladies who are willing to act as intermediaries for the purchase of goods, for people who are unable to go there and do their own shopping. Such circulars go originally to the personal friends of the would-be purchasing agent. Of course, after a lady has been in the business for a few years, her list of clients increases steadily, year by year. Some of the experienced purchasing agents get a double commission—their percentage off the retail price of the goods and a bonus from the buyer for exercising their skilled judgment and taste in the matter of selecting goods. Frequently ladies from out-of-town, coming to New York for a season of shopping, will engage a shopping agent by the day to accompany them from store to store. The purchasing agent pays nothing for carriage hire on such occasions, and is usually treated to luncheon or dinner by her employer.

A DECEIVING SHAM.

Every good thing has its hosts of imitators; every genuine article its counterfeits. And imitators always choose the most pronounced, valuable or popular subject to counterfeit, so that when they claim their sham to be equal or as good, or the same as "So-and-So's," the public may depend upon it that "So-and-So's" article is the best of the kind. The sham is always proving the genuine merit of the thing it copies. The ——— Baking Powder Company have produced and popularized an article of household use, whose convenience, usefulness and real merit have been made for it an immense and universal sale. A hundred imitators arise on every hand, and as they hold out their sham articles to the public, they cry in chorus, "Buy this; it's just as good as the ———, and much cheaper!" The ——— baking powder is the standard of excellence the world over, and its imitators in their cry that theirs is "as good as ———" are all the time emphasizing this fact. In their laborious attempts to show that their goods are as strong as wholesome, or as pure as the ——— by their contortive twistings of chemical certificates and labored efforts to obtain recognition from the Government chemists and prominent scientists who have certified the superiority of ——— over all others, by their copying even the style and wording of the ——— advertisements, they all admit the ——— to be the acme of perfection, which it is their highest ambition to imitate. But the difference between the real and these imitations, which copy only its general appearance, is as wide as that between the paste and the true diamond. The shams all pay homage to the ———.

In the above circular, which has come to us, we observe that a well known ammonia-laden baking powder concern has revived its old and well-known methods of deceiving advertising again. It starts out with the one truthful assertion that every good thing has its hosts of imitators," but there it meanders back into its old beaten path of claiming for itself all the virtues of a superior baking powder, and by falsely alleging

that all other baking powders had chosen its formula as being the most valuable and popular. As the public well know that ammonia is not a desirable addition to a baking powder, no manufacturer having any common sense would imitate this, the weakest point in their baking powder. Indeed, it is a well-known fact that, if this concern had the chance to commence life over again, they would carefully leave it out, but as they have committed themselves to it, they think they must brazen it out and try to divert attention from themselves by flinging mud at their more fortunate competitors. The want of truthfulness of this concern can easily be judged by the public when they compare the false allegation that their competitors claim to make as good a baking powder as theirs with the advertisements of their competitors, not one of whom ever mentions the ammonia baking powder but with derision. The statement that any respectable baking powder manufacturer has ever twisted a chemical certificate is, of course, false, and must be only made for the purpose of leading the public to forget that the Ammonia Powder Company has for years published interpolated and false government reports, and has had a score of lawsuits brought against it by chemists who claimed that their certificates had been improperly obtained and misleadingly used.

CALIFORNIA VINEYARDS.

THE CULTIVATION OF THE VINE IN THE GOLDEN STATE.

Creeping slowly but insidiously up the hill-sides, as if maintaining a haughty reserve, in the midst of the rush and roar of Anglo-Saxon progress, are the vineyards of California. It may be that the product, so highly sensititive as almost to give evidence of intelligence, has found a means of imparting to the vine some of the indignities which an unappreciative public has heaped upon it, and this may account in a poetic way for the preference which all noble vines evince for the higher altitudes. But the present generation of Ayrians scoff at poesy, and persist in judging wine-making by the standard of '49—that of gold—and the eminent practical *vigneron* will unblushingly tell you that vineyards are planted upon the hill-sides because experience, the most exacting of all teachers, has proven them best adapted to his purpose. And this wine-maker of California has a purpose, born of the spirit which animated the padres and cavaliers when they brought civilization to the coast, and with it the cultivation of the vine. He aims at nothing short of perfection, and his struggle to attain this end belongs to the heroics of our State's history. From a financial standpoint he is a martyr and patriot; commercially, he is a missionary and advocate; and intellectually, he is both student and teacher. In this latter capacity he has made mistakes, the most grievous of which was in attempting to teach that of which he knew but little himself. Catching inspiration from the padres, he eagerly continued planting and propagating the Mission grape long after the Missions had passed into secular hands, and the fathers had abandoned both their spiritual and temporal vineyards. From 1770 to 1855 the Mission grape held uninterrupted sway. It was grown with more zeal than intelligence, and its product treated with more energy than skill. There could be but one result—utter and complete failure—where an attempt was made to produce every known brand of wine, and some that it would be better never to know, from one kind of grape! This was in the days when the California *vigneron* felt quite competent to teach his neighbor all about wine-making! He has had several accessions of modesty since then, and has repented in financial sackcloth and ashes many of the sins he has unwittingly committed against this noble industry. Colonel Agaston Haraszthy, an Hungarian nobleman, was the first man to make any effort to import European wines. In 1852 he received his first shipment of cuttings, among which was our well-known but much-regretted Zinfandel. These he planted at Crystal Springs, near the site of the enormous concrete dam from which Spring Valley supplies the city water, and had it not been for the fogs and cold winds preventing proper ripening, the eight-mile reservoir would have undoubtedly been the location of the first pretentious vineyard in the State. But wine and water will not mix to advantage, either in nature or glass, so this irony of fate was averted by the vines being transplanted to Sonoma, in the celebrated Buena Vista Vineyard, which phylloxera devastated long ago. Colonel Haraszthy's activity created a tidal wave of inquiry over the quiet valley of Sonoma. Strangers came and went, the pony express and the United States mail were laden with letters, pamphlets, cuttings and vines. This was a season of great hopes, of loud talk, and much proselyting in the agricultural districts. Wine-making was justly esteemed a gentleman's occupation, and everybody had the courage of ignorance. In 1861 Governor Downey appointed a commission to report upon the industry, especially ways and means of improvement, but it was not until 1880 that a viticultural commission was created by act of the legislature. Planting a vineyard and making wine is a gentleman's occupation—the very highest type of agriculture—and a visit to any section where the industry has taken root finds the beautiful valley and sunny slopes thickly studded with lovely country homes, and one glance at the interior reveals the refined taste of the viticulturist's family. The wine men of California are broad-gauge citizens and thorough good fellows, in every sense of the word. They represent the wealth and intelligence of the communities where they live. There are sixty-eight millions of dollars invested in vines, wines, and cellar capacity in this State, giving employment to ninety thousand men, and if there have been periods of depression, and if somebody has blundered by fancying himself a wine-maker when God intended him for a blacksmith, the blame must not be laid at the door of the industry or its possibilities. If experience has proved that the Mission Fathers and their followers planted neither wisely nor well, there is reverence and respect for their memory, since they followed their best light, and at least tried to do the right thing at the right time. The Zinfandel, from which so much was expected, has not lived up to promise as a producer of either fine or durable wine. Its admirers were hugely disappointed, but, with Spartan-like courage, they have pulled up the vines, planted resistant stock, grafted on this cuttings from Chateau vines, and who dares say that in time the nomenclatures of our vineyards, with their pretty Spanish names, will not sound as sweet to the ear of the connoisseur as do those of the Lafite, Latour and Margaux? There are three distinct wine districts in California: the Coast Range District, which includes Sonoma, Lake, Napa, Alameda, Santa Cruz, and Santa Clara Counties; the Sierra Nevada Foothill and Sacramento Valley District, taking in Placer, El Dorado, Tuolumne, Yuba, Yolo, Sacramento and Tehama Counties; and the Southern District, embracing San Bernardino, Los Angeles, San Diego, and Fresno Counties. The first excels, on the whole, in white and red acid wines, such as hock, claret, Sauterne, Burgundy and others; the second produces most excellent dry wines of exquisite bouquet, many of which bear a greater resemblance to the wines of Hungary, Greece and Cape Constantia than those of France, Italy or Germany; while the third district excels in its port, sherry, Madeira, angelica, and other sweet wines. Out of the fifty-two counties there is not one that does not produce grapes; forty-five make wine, either for sale or home consumption; and twenty-four counties make wine for export. The largest vineyard in the world—that of Senator Leland Stanford—is in Tehama County, and consists of 3,825 acres, or about 3,060,000 vines. California also has the smallest vineyard in the world—the one grape-vine in Santa Barbara County, which is seventy years old, has a diameter of one foot twelve inches from the ground, and whose branches cover an area of 12,000 feet. This one vine produces from 10,000 to 12,000 pounds of grapes, and the old Mexican woman who planted it used to have her Indian *peons* make wine from these grapes by treading them with their bare feet. It is believed that there are planted not less than 150,000 acres of vines in the State, and it is safe to estimate that fully sixty per cent. are of the finer grades of foreign wine grapes. It is difficult to form a close estimate of the wine yearly consumed on this coast. I am led to believe that not less than 2,000,000 gallons are used in San Francisco and Oakland, and about 3,000,000 more in the interior of the State, in Arizona, Oregon, Washington, Nevada and Utah. The amount exported to the Eastern States and foreign countries will not fall far short of 10,000,000 gallons this year. Reckoning in the sweet together with the dry wines, this would give them an approximate value of about $6,000,000. The brandy used on this coast, if exported, would swell the amount at least a million more. Mexico awakened to an appreciation of our wines earlier than any other foreign country, and her trade in our wines grows steadily. There is no more hopeful field for California than Mexico and Central American countries. The Sandwich Islands and Japan have been increasing consumers, while British Columbia bids fair to become equal to that of Panama and South America. The European countries have done very poorly with us, but that market is very like carrying coals to Newcastle. Our Eastern cousins drink plenty of California wines under French labels, and smack their lips with evident satisfaction. Some time, when the millennium is not far off, the average American may have the courage of his convictions, and when he does, and knows enough about wines to be entitled to an opinion, it will be a hopeful day for the California grape-grower.—*Frona Eunice Wait, in The Argonaut.*

ANCIENT SKILL.

SOME STRIKING FEATS OF ANCIENT ENGINEERING.

The bumptiousness of modern engineers gives little offence, because it is honest and guileless. Perhaps the order of mind which devotes itself to that pursuit is commonly averse to historic reading, and in any case the hard mechanic training necessary for an engineer of the present day disinclines him to spend his scanty leisure in studies which cannot be turned to account. The result is that he conscientiously believes his art to be the special flower and glory of the age—in which he is not altogether wrong; but beyond that he regards all earlier feats of engineering as unworthy of serious discussion. And the public, as ignorant, with less excuse, encourage this view. It is waste of time to ask him how the boulders of Stonehenge were conveyed to their resting-place; how the walls of Fiesole or Mycene were built. These marvels represent the power which lies in the brute force of multitudes, and there's an end of the question. Engineering is now an art and a science, with which the rude work of the savages has no sort of connection. One must not inquire why he takes it for granted that Stonehenge, for example, was built by savages; where the brute multitude came from; how they subsisted on Salisbury Plain, or why it is necessary to assume that they were unacquainted with mechanics. All that is *chose jugée*—beyond dispute. If you cite records of antiquity which tell of works he cannot rival, that fact alone is proof that the record is a lie; for how can it possibly be that mere Greeks and Romans should have been able to do what the builders of the Eiffel Tower and the Forth Bridge cannot accomplish? We had an amusing instance of this feeling lately. The ingenious M. Eiffel and the artistic M. Bartholdi have been gravely pondering the Colossus of Rhodes—measuring it and weighing it as per description, and they conclude that the thing was simply impossible. It could not have been set up, to begin with, and when set up it could not have stood the pressure of the wind. This is demonstrated by all the rules of modern science, and he who does not admit the demonstration must be prepared to show that two and two do not make four.

Those antique personages who professed to have seen the Colossus were victims of an ocular delusion, or flat story-tellers, and that greater number who mention it incidentally, as we might mention the ruins of the Colosseum, were credulous gossips. The fact is that Messrs. Eiffel and Bartholdi argue in the fashion usual with engineers. Not all of them would pretend that they know every law of nature which applies in such a case, but very few would listen patiently if it were urged that the ancients knew some laws with which they were unacquainted. So it appears, however, to the disinterested student, and we can bring forward evidence enough. If it be true that the Colossus of Rhodes is really proved "impossible," according to the best modern authorities, this is a good illustration to begin with, for its existence is as well authenticated as the Temple at Delhi and the statue of Olympian Zeus, or the Tower of London, for that matter, to one who has never seen it. By some means it was set up, and by adaptation of some natural laws it was made to stand until an earthquake overthrew it. One is embarrassed by the number and variety of illustrations to the same effect which crowd upon the mind. Since the Colosseum has been mentioned, we may choose examples of that class. Is M. Eiffel prepared to put an awning over Trafalgar Square when the sun shines, and remove it promptly without the aid of a central support, of steam-engines, or even chains? The area of the Colosseum is certainly not less. This may seem a trifling matter to the thoughtless, because they have never considered it. Roman engineers covered in that vast expanse with some woollen material, and they worked the ponderous sheet so easily and smoothly that it was drawn and withdrawn as the sky changed. The bulk of it must have weighed hundreds of tons, all depending by ropes from the circumference. But the ancients thought so little of this feat that they have left us only one trivial detail of the method. So Julius Cæsar stretched an awning above the Forum Romanum and great part of the Via Sacra in the space of a single night. Have any of our modern engineers pondered the contemporary descriptions of Alexander's durbar tent before Babylon? That, again, appears to have had no central support. It was upheld, says Phylarchus, by eight pillars of solid gold. Of the glorious plenishing within we have not to speak, since our theme is mechanics. Around the throne and the great courtiers stood 500 Macedonian guards; in a circle beyond them 500 Persian guards; beyond these again, 1,000 archers. To fix a tent which held 2,000 soldiers on duty, with arms and accoutrements, surrounding, in successive circles, the most gorgeous Oriental court that ever was, with hundreds of satraps, councillors, generals, eunuchs and slaves, would perplex a mechanician of the nineteenth century. He will reply that the story is false—must be, because he could not match it. Happily, the awning of the Colosseum stands beyond dispute, and Alexander's tent is a small matter compared with that. But we undertook to deal with the engineering of the ancients in connection with the theatre, having chanced on that class of illustration. Pliny tells how Metellus Scaurus, Ædile, built a wondrous edifice, which stirred his rival, C. Curio, to frantic jealousy. It may be worth while in passing—since we are all so much interested in the theatre nowadays, and think so much of our new ones—to tell what sort of a building that was which Curio set himself to outdo. It had 360 marble columns, each 38 feet high and 38 feet apart. About 2,000 bronze statues stood among them. The stage had three floors, as was usual; the lowest paved and fitted with marble, the second with glass, the third gilded, boards and all. It held 80,000 people. This account will seem so fabulous to steady-going Britons, that it is prudent to give chapter and verse. The description will be found, with curious details and passionate reflections on the luxury of the day, in Pliny's Natural History, xxxiii. 24. Such was the wonder which Curio resolved to beat, and feeling himself unable to vie in outlay, he summoned the engineers of the period to design something which would "fetch" the public. They built two enormous theatres of wood, each to contain an audience of 25,000, which stood back to back. When the spectators assembled in the forenoon Curio was chaffed, no doubt, on the issue of his attempt to excel Scaurus. But the audience returned in the afternoon, for these entertainments were devoted to the manes of Curio's father and lasted a month. In the place of two theatres, back to back, they found an amphitheatre holding 80,000 persons, wherein gladiators and wild beasts contended until dewy eve. The two great buildings had been swung round and united; and day by day, for the month following, this colossal trick was repeated. The perfervid indignation of Pliny could not make him altogether indifferent to the ingenuity of the thing. The fact is, in brief, that those who know what ancient engineers did, with their imperfect means, feel a qualified admiration for the works of the moderns. If Archimedes or Stasicrates had been acquainted with the forces and the laws with which every old woman is familiar in these days, they would have changed the face of the earth and the destinies of mankind.—*St. James's Gazette.*

SAL SODA.

THE MANUFACTURE OF SODIC CARBONATE.

The history of the manufacture of sodic carbonate, or sal soda, is an interesting one, as it was a direct result of a chemical research, and has been an important factor in the commercial prosperity of France and other countries. Carbonate of soda is used in immense quantities in the arts, especially in soap and glass making, and its cheap production is a matter of great importance. Carbonate of soda occurs but very sparingly in nature. The *natron* of Egypt and the *trona* of Africa and South America are examples. Up to the latter part of the last century the principal source of supply was obtained by burning the ashes of a marine plant growing on the coast of Spain. This ash contained about one-fourth its weight of sodic carbonate, and the cost of its production was necessarily large. But even this limited source of supply was curtailed during the wars of the French Revolution, and Napoleon, realizing the importance of a supply of the substance, offered a premium for the discovery of a process by which it could be cheaply manufactured at home; and this led to the discovery of the LeBlanc process, by which sodic carbonate can be abundantly produced from sodic chloride, or common salt, at a cost far less than that of the old-fashioned way of burning sea-weed. The first step in the process is the transformation of the sodic chloride into sodic sulphate, which is accomplished by heating it in a reverberatory furnace with sulphuric acid, the reaction being as follows:

$$_2(Na\ Cl)+H_2SO_4={}_2(H\ Cl)+Na_2SO_4.$$

The hydrochloric acid gas (H Cl) is absorbed by water to form the commercial muriatic acid, which commands a ready market, and is an important factor in the economy of the process. After the sodic sulphate, or "salt cake," as it is called, has become thoroughly dry, it is mixed with fragments of limestone and coal, and again strongly heated, when it fuses to a dark-colored mass, known as "black ash," composed of sodic carbonate, lime, and calcic sulphide. The chemical reactions which take place are rather complicated, but we give them below, as they may be of interest to students of chemistry. First, when the sodic sulphate is heated with the coal, or carbon, it is changed to sodic sulphide, while carbonic acid gas is evolved, thus: $Na_2\ SO_4+C_4=Na_2\ S+4CO$. Again, when calcic carbonate is heated with carbon, carbonic oxide is given off, and calcic oxide, or lime, remains: $Ca\ CO_3+C={}_2CO+Ca\ O$. Finally, when sodic sulphide and lime are heated together in the presence of carbonic acid gas, sodic carbonate and calcic sulphide are produced: $Na_2S+Ca\ O+CO_2=Na_2CO_3+Ca\ S$. The soda ash produced by treating the black ash with water and evaporating the solution to dryness, is not pure, but contains a certain amount of caustic soda, formed by the action of the excess of lime upon the sodic carbonate. So the crude soda ash is mixed again with powdered coal, and heated, when the carbonic acid gas formed converts the caustic soda once more into carbonate, and it is only necessary to dissolve the mass in water and crystallize out the pure sodic carbonate. Later, the Solvay, or ammonia-soda, process for the manufacture of the carbonate was introduced, and would have entirely superseded the LeBlanc process if it were not for the fact that the latter produces, as a by-product, a large amount of hydrochloric acid, which finds a ready sale, thereby rendering it slightly more economical than the Solvay method. The latter process depends upon a curious reaction between sodic chloride and hydro-ammonic carbonate, as follows:

$$Na\ Cl+NH_4H\ CO_3=NH_4Cl+Na\ H\ CO_3.$$

In practice, the solution of sodic chloride is mixed with about one-fifth its volume of ammonia, and carbonic acid gas passed into it, when the sodic bicarbonate is precipitated. The bicarbonate is converted into carbonate by simply heating, while the ammonic chloride is decomposed by lime, and the resulting ammonia gas used over again. Several methods have been proposed by which the chlorine at present lost in this process may be recovered, but until this can be profitably accomplished, the rivalry between the LeBlanc and Solvay systems will probably continue. Another by-product of the LeBlanc process is sulphur, from the sulphide of calcium. This was formerly thrown away, thereby creating a nuisance, but the sulphur is now recovered in its elementary form and sold at a profit. Hydrosodic carbonate, or saleratus ($H\ Na\ CO_3$), is formed directly in the Solvay process, but is usually made by exposing the moist carbonate to an atmosphere of carbonic acid gas, thus: $Na_2CO_3+CO_2+H_2\ O=2\ (Na\ H\ CO_3)$. It is principally used in the manufacture of baking powder. The interdependence of the arts is well illustrated by the history of the LeBlanc process. The cheaper production of the soda ash led to its increased use in glass and soap making, and the consequent cheapening of those articles led to an increased demand, which, in turn, created a still larger demand for soda ash. The extension of the soda-ash manufacture led to a demand for larger quantities of sulphuric acid used in the process, which gave rise to so many improvements in its manufacture that its previous high price was gradually reduced to the present nominal cost, allowing it also to be used freely in many other arts and manufactures. The increased production of hydrochloric acid as a by-product cheapened the cost of bleaching powder and greatly benefited the cotton-bleaching and calico-printing industries. In short, it may be said that the indirect result of the French wars which led to LeBlanc's discovery was of more benefit to mankind than the direct benefit of all the wars and battles that have occurred since the dawn of civilization.—*Popular Science News.*

OLEOMARGARINE.

THE U. S. COURTS *vs.* STATE PROHIBITORY LAWS.

A very important decision has just been rendered by Judge Nelson, of the United States Court at Minneapolis. In that State a law prohibiting the manufacture and sale of oleomargarine had been passed. A man was arrested for violating this law, upon being brought before the United States Court, on habeas corpus proceedings, Judge Nelson decided the law unconstitutional, because it infringed upon the constitutional rights of the citizens of other States and also because the national legislature had amply provided for the lawful manufacture of oleomargarine. It looks now as if, with a few more decisions of this kind in other States, the justice and practicability of the federal oleomargarine law, so far as it provides for the protection of the consumer and compels the sale of oleomargarine for what it is, will prove itself a wise and practical law, but that part of it which extorts excessive taxation and oppressive license fees, almost amounting to prohibition, will be repealed at an early date.

FASTING AND NUTRITION.

BY DR. LUIGI LUCIANI, PROFESSOR OF PHYSIOLOGY IN FLORENCE.

At all times there were men who furnished proofs of their extraordinary attainments in eating; but it was only in our times that virtuosos of fasting have made their appearance. Among all the representatives of this strange art the Italian Succi has created the greatest sensation. He has repeatedly fasted for 30 days without his bodily and intellectual functions being impaired in a noticeable degree. With regard to the causes of his great power of resistance, opinions were widely divided. Succi himself tried to spread a belief that he was in possession of a marvellous liquor the use of which rendered it possible for him not to require any food. It seems that Succi propagated this notion for the purpose of procuring a steady income from the sale of this liquor. But this liquor was found to be a compound opiate, well fit to appease the pangs of hunger, but without any nutritive value. The physicians who had observed him during his exhibitions at Milan, were inclined to consider him insane. This opinion was freely expressed by Dr. Lava in Turin. How is it possible, he asked, to look for a reason of his power of resistance? Is it a new thing to see insane persons support hunger without feeling any pain or complaint? Professor Lombroso declared Succi an hysteric whose power of resistance was the result of autosuggestion. Dr. Battaglia was of opinion that it was a case of anæsthesia, by which the central portion of the nervous system had been attacked. All these views were not without plausibility; for Succi had actually been twice under treatment for insanity. The above mentioned author, having subjected Succi to uninterrupted observation, either by himself or by an assistant, during thirty days of fasting in Florence (March 1 to March 31, 1888), and having instituted the most searching investigations on the subject, declares that he considers him "rather eccentric and somewhat odd yet not insane," and he explains Succi's power of resistance by his bodily constitution and its physiological working. Before beginning his fasting performances, he used to prepare himself by copious eating. His digestive function being in an excellent condition the excess of nutritive material, which had been ingested, was accumulated in the shape of fat, glycogen and albumen; on this he lived at the time of his fasting. Besides this, it has to be considered that Succi was a full grown man, whose period of development was passed long ago; and, lastly, his process of assimilation was slow in consequence of an inherited disposition, as shown by the comparatively small secretion of urea and the slackness of the respiratory and combustion processes. As causatively connected with this peculiarity, Luciani regards the fact that Succi's blood is unusually poor in red blood corpuscles, which are known to perform the important task of fixing chemically the oxygen inspired and of conveying it to the tissues in need of it. During the 30 days of fasting Succi never complained of any suffering of any kind, was never in very much need of rest, nor was he subjected to insomnia; his body was not considerably emaciated, and, on the thirtieth day, very far from extreme stage of starvation. Luciani thinks that Succi could have continued his fasting for 20 days longer, although perhaps not without some injurious effects, yet without danger to his life, and he supports his estimation by Chossat's researches, according to which death by starvation results only after 40 per cent. of the original weight of the body has been spent, while Succi had not lost more than 19 per cent. at the end of his fasting period. During this time he indulged in much motion, walking every day 3,000–4,000 paces on an average. On the twelfth day he took a ride of an hour and a half's duration; on the 23d day he took part in some popular games, where he showed force and ability in a fencing performance. On one of these days he made, as noted by the pedometer, 19,900 paces, on another day he made 7,000. It is true that in consequence of inanition the muscular work had somewhat decreased, but not in a degree which would be regarded as morbid. Nor was to be observed a decrease in the working of the sensual organs, nor a fatigue in his mental power. In no respect, during the whole fasting period, was there any symptom of a neurotic condition or of some deviation in the principal functions of the nervous system. He was always good-humored, talkative, never unpleasant, neither towards the persons who had to observe him nor towards the visitors. The only thing which seemed to occupy his mind was his money interest, for which he had a steady and uniform attention. Ideal motives were unknown to him; he hoped to make a fortune out of his fastings and enjoy it in peace afterwards. Succi's beverages were mineral waters from Riolo and Vichy, which are distinguished by their contents in alkaline carbonates and free carbonic acid. In this connection Luciani made the interesting observation that the use of these mineral waters produced a lowering effect on the activity of the process of nutrition. At first sight, this observation seems to be in disagreement with the general view entertained by practitioners, that these waters have an evacuating, withdrawing and debilitating action on nutrition, for which reason they are often successfully prescribed against obesity. Luciani explains this apparent contradiction by Bunge's views on J. Forster's and Lanin's experiments, who had demonstrated that alimentation with substances which had been deprived of their mineral parts was rapidly followed by injurious results. This portion of Luciani's investigations is highly important. "Mineral waters," he says, "are therefore to be regarded as substances of nutrition which, by their combination with the plastic substances of the tissues, provide the latter with a solid support, as it were with a skeleton, and, I might say, furnish the stones for the building." This might also explain why the use of Karlsbad water has such a highly favorable action on the condition of diabetics. Another important fact resulting from Luciani's observations is the apparent existence of some regulatory system, which, during the period of physiologic hungering, subjects activity and consumption of the several tissues to a common control, to a kind of mutual solidarity and compensatory interchange. Luciani thinks that this regulating element is represented by the nervous system, which in a way compels the tissues to provide for its needs, in controlling the chemical process, and consequently the use of its products during the period of fasting. The nervous system preserving during all this time all its wonderful activity, just as in normal condition, and spending its gifts as before, it is to be concluded, as Moleschott already has pointed out, that it acts in the fashion of the great and powerful, living out of the pockets of their subjects and, as it were, sucking their blood as long as they can find any. As long as this highest regulator is in reception of sufficient material for his maintenance in normal condition, the process of involution through inanition is only physiologic; but as soon as the work furnished by the several tissues becomes insufficient for the maintenance of the regulator in his position, he has to decay, he ceases to regulate, and physiologic inanition is converted into morbid inanition, which soon leads to the collapse of the whole fabric, *i. e.*, death. These facts suggest a perfect analogy between a state in the usual meaning of the word and the "cellular state," if we may give this name to the human organism. We see that its elements, the cellules, tissues and nerves, have to fulfil very different duties while endowed at the same time with different rights and privileges. The nervous system stands at the head of the organism; it is the supreme regulator for receipts and expenses. For the purpose of enabling it to satisfy this task, it is relieved of all immediate care for its own existence; it relies for its maintenance on the tissues which in days of penury are drained by it to the verge of exhaustion. From this standpoint the nervous system plays the paat of a parasite. Chossat has found that starvation makes the loss of the fatty tissue 93 per cent. of its original weight, the muscles 34-35 per cent., and the nervous system 2 per cent. only. It is obvious that there is nothing like absolute equality in the "cellular state." If Nature had acted on this principle, she would have stopped at the production of unicellular organisms, among whom, as experience teaches, the struggle for existence is fiercest. The principle of organic construction is differentation or sundering, in fact, an aristocratic principle worked out in the economic co-existence of the cellules in unequal functions, and at the same time endowed with unequal rights and privileges. As soon as this unequality ceases, the economic organism collapses and death is the result. This is the beginning of anarchy in the organic world, the rule of the elementary atoms withdrawn from their connection.—Abstract from *Das Hungern, Studien und Experimentiam Menschon.*

JOB'S SCIENCE.

THAT MUCH AFFLICTED INDIVIDUAL ANTICIPATING THE STEAM-ENGINE.

The last place in which one would naturally look for a description of the modern steam-engine would be the book of Job. Yet a recent author has presented in a large octavo volume of 362 pages his conclusions on this very point. They are to the effect that the entire steam plant, railway organization, boiler and engine practice, are treated of by the inspired writer. We allude to the work of Mr. Samuel O. Trudell, entitled "A Wonderful Discovery in the Book of Job." If the author's view of the case were adopted, the *Scientific American* declares, a new chapter in the history of the steam-engine would be supplied, and the Marquis of Worcester would have to yield to Job as the pioneer in steam engineering. Behemoth and the Leviathan have always been fertile subjects of controversy. The whale and hippopotamus respectively have been adopted by many commentators as the animals referred to. But Mr. Trudell goes beyond the most daring innovator, and in a revised version of the passages relating to these monsters finds allusions to the steam-engine of to-day. A description of the method followed in his new interpretation will give the best idea of this most striking effort in the field of biblical criticism. The author, fully to support his theory, has been compelled to furnish a new rendering of the parts of the book of Job which he uses. Accordingly, we find a translation given of the passages in chapters xl. and xli. which relate to the Behemoth and Leviathan. The claim is made without reserve that it is the modern steam-engine in its different forms that is there described. It is evident that our space does not permit us to give the full bases for the argument. The separate verses are made subjects of as many chapters, and the analogies traced between the descriptions in the poetry of Job and the more prosaic steam motor are really surprising. The most curious details are traced out, such as the supply of water to the boiler, the upright smoke-stack, and even the manipulation of the stock of railroad companies is found described. The size and number of pages in the volume give the best evidence of the work bestowed by the author upon his labor of love. It may be worth while to cite from the special translation appended to the book some of the most striking passages. The account begins chapter xl., v. 15, "Behold now one with great heat, ... he will consume fodder as well as cattle do," which is a pretty fair description of a steam-engine. A little further on, v. 17, it says: "His tail will set upright like a cedar." This, the author concludes, refers to the smoke-stack. In v. 18 we find, "His hollow bones are tubes of brass; his solid bones are bars of iron," which is a very good embodiment of modern engineering practice. In v. 21, which the special translation renders, "He will rest beneath light shelters and within a covering of fibrous reeds and clay," the author finds an allusion to non-conducting covering for boilers and steam pipes. Going on to the next

chapter, we find v. 6 thus rendered: "Companies will feast upon him, they will share him among speculators," which it is needless to say fits the case of modern railroad companies and speculators exactly. This is one of the extraordinary parallels of the work. It is perhaps equaled by v. 2 of the same chapter, where the hook (ring) in the monster's nose is construed as an allusion to the piston rings of a locomotive, and where the jaw bored through with a thorn supplies an allusion to the piston head bored through with its piston rod. The bad effects of an engineer allowing his water to run down is given in the same chapter, v. 26: "From dryness rendering him furious, he will not have power to withhold; the curved vault being caused to break up and also the armor." This, of course, means that the engineer must watch his water gauges or there will be an explosion. For a portion of v. 23, chap. xl., and for v. 24 immediately following, the author furnishes the following translation: "Behold, he will absorb a river, and will not fret; . . . . he will gather it up in his fountains by means of traps and with a perforated nozzle." Our author in this finds described the action of a pump with its valves (traps), and the perforated suction-pipe with a screen at its end to exclude solid particles. Even the coupling together of a train of cars is found in v. 1 of the next chapter: "Thou wilt extend Leviathan with a hook, or with a snare which thou wilt cause his tongue to press down." The tongue our author believes is the representative of the coupling link, and the hollow drawhead and pin is the "snare." The caulking of the seams of the boiler is found in v. 15 of this chapter: "His strength depends on courses of shields closed up tightly with a seal." Our author finds nothing clearer than that the "shields" are boiler plates, and the "seal" the caulking iron. He reserves, however, the possibility that the steam riveter is the sealing mechanism. This much is enough to give an idea of the book. The author has been his own Hebraist. The Semitic student and author, Rabbi Benjamin Szold, of Baltimore, testifies to his high opinion of Mr. Trudell's translations. It must also be said in conclusion that the subject is treated throughout with full evidence of critical discernment and laborious investigation.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

December.

MEATS.—Beef, mutton, pork, venison, veal.

POULTRY AND GAME.—Chickens, fowls, ducks, geese, turkeys, grouse, capons, hare, partridge, pheasants, rabbit, pea-fowl, guinea-fowl, snipe, widgeon, wild duck, woodcock.

FISH.—Brill, carp, cod, crabs, perch, salmon, smelts, soles, sprats, tench, turbot, whiting, halibut, sturgeon, oysters.

VEGETABLES.—Jerusalem artichokes, beets, broccoli, cabbage, carrots, celery, endive, winter spinach, eschalots, turnips.

FRUIT.—Apples, oranges, bananas, nuts.

PRACTICAL RECIPES.

FISH CROQUETTES.—Make a cream sauce with a lump of butter the size of an egg and two tablespoonfuls of flour rubbed together, and cooked for a few moments on a frying-pan; then add sufficient milk to thin it out to the consistency of thick cream; add a little finely-minced parsley and pepper and salt. Have any cold fish finely shredded, and with it mixed about a third of its quantity of cold potato. Put sufficient of this in the sauce to make it stiff enough to handle. Form into croquettes with the fingers, dip them in egg and cracker dust and fry in very hot lard.

MACARONI AND TOMATO SAUCE.—To one-half pound of macaroni put one quart boiling water, and let it boil steadily until it is very nearly done. Strain out the macaroni, empty the saucepan, put the macaroni back again with a little fresh butter, and work it about with a fork until done. The butter prevents it from sticking together, which is an unpardonable fault. Now make a tomato sauce as follows: Cook a can of tomatoes with half an onion cut in pieces and six whole cloves; strain through a colander, mashing all the tomatoes through; return to the saucepan; add a lump of butter, pepper and salt, and sufficient flour rubbed smooth in a little water to thicken it to the consistency of thick cream. Put the boiled macaroni in a dish, pour the sauce over it and serve.

ORANGE AND BANANA JELLY.—Make a pint of orange jelly. A simple way is to buy a little cake of stiff orange jelly for sale at grocery stores, which, with the addition of a pint of boiling water, makes it the right consistency, and to it add the juice of a large orange and the pulp, with all the skin removed from it, of two and one-half oranges. Slice three bananas into the jelly, pour into moulds, and set away to stiffen and get very cold; whip up one-half pint sweet cream, sweeten it, flavor with about eight drops of vanilla. Turn the jelly into a dish, keep the cream about it and serve.

STEWED KIDNEYS.—Remove the fat from one and one-pounds of beef kidney, slice it and let it lie in cold salted water for twenty minutes; then put them in a saucepan with three pints of cold water, and boil for two hours; half an hour before dishing put in one onion cut in slices, a little grated nutmeg, one teaspoonful of sage, pepper and salt to season, and a wineglassful of good Madeira wine, and serve very hot; sieve some fine sugar over the top, and bake in a quick oven.

CREAM PUFFS.—Put three cupfuls of water into a porcelain-lined kettle, bring it to the boil, and add one-quarter pound of butter; as soon as it is melted sift three teaspoonfuls of baking powder with three-quarters pound of flour, and stir it rapidly into the water. This makes a stiff dough. Remove it from the fire, and when it has cooled slightly work in gradually with a large spoon six eggs, and stir till it forms a smooth, sleek paste. Drop this in large tablespoonfuls on a greased pan, and bake to a delicate brown in a hot oven. When cold split open a small place at one side, and fill with the following mixture: One pint of milk, two tablespoonfuls of corn-starch, one-quarter pound of powdered sugar and two eggs. Mix the corn-starch with some of the milk, put the ingredients together, place over the fire and cook till it thickens; flavor with vanilla.

SHADES AND COLORS.

EXPLANATION OF SOME OF THE FASHIONABLE NAMES.

Fashionable colors are always of interest to the trade. Below we give the names of a few of the shades most talked of around the markets at this time, together with definitions of what they really are in plain English: *Mais*—A light corn yellow. *Ebenier*—A shade darker than mais. *Ble d'or*—A ripe wheat yellow. *Toreador*—Two shades darker than ble d'or. *Paille*—A light lemon color. *Bouton d'or*—A golden yellow. *Melon*—An ochre shade similar to the inside of a French melón. *Vielle Paille*—A faded light straw shade. *Australien*—A dull ochre yellow. *Monaco*—A pinkish yellow, the shade of the inside of a banana. *Ciel*—A pale blue. *Myosotis*—A shade darker than ciel. *Edison*—A light electric blue. *Niagara*—About three shades darker than Edison. *Camelia*—A cedar-wood red. *Brasil*—A rose-wood red. *Coquelicot*—A bright poppy red. *Cardinal*—A shade darker than coquelicot. *Pourpre*—A shade deeper than cardinal. *Grenat*—A garnet red. *Vieux-rose*—A medium shade of ashes and rose. *Marronniere*—A deeper shade of vieux-rose. *Nile*—A light green.—*Can. Jour. Com.*

CAMPHOR IN FLORIDA.

A PROSPECTIVE INDUSTRY WITH ENCOURAGING INDICATIONS.

The camphor-tree grows in Florida in almost any kind of soil, is in a growing condition for about nine months during the year, and is not affected by cold weather. After two or three years it will grow with little or no care, and even in the poorest land was found to have produced at twelve years a trunk fourteen inches in diameter. Another tree ten years old had grown two trunks, each ten feet high and twelve inches in diameter, the total height of the tree being between thirty-five and forty feet. It is apparent from these statements that the camphor-tree is of rapid growth. When between four and five years old, it has attained a height of ten feet and a trunk diameter of four inches. From some trees of this size the Messrs. Beach, of Palatka, cut branches about one inch thick at the base, and, with the leaves, subjected them to distillation, the wood and every other part of the tree being rich in camphor. Using an improvised still, the yield from thirteen pounds of branches was a common teacupful of crude camphor; but it is estimated that about one-half of the product was lost in distillation. The still consisted of a common iron kettle, holding ten gallons, to which was fitted a wooden cover plastered over with clay, and this was connected with a one-inch galvanized pipe. The kettle was charged with the camphor branches and a small quantity of water, and the distillate was collected in a five-gallon cracker can; the condensed oil, by reducing the temperature, separated the camphor. It is claimed that if cultivated on a sufficiently extensive scale the camphor-tree would yield much larger profit in Florida than any other product of the soil. In addition to this, it should be noted that the camphor-tree is an evergreen of handsome appearance, and hardy in that climate; that it is not eaten by cattle and other stock, and that in a few years it does not require the protection of a fence, being then strong enough not to be broken down by cattle. It flourishes in almost any soil, like the native pine and oak; is not attacked by insects; no loss occurs by the dropping or stealing of fruit; and every part of the tree can be utilized. Messrs. Beach think that in ten years more camphor-trees will be growing in Florida than orange-trees, and that this industry will prove to be more profitable than the production of sugar. At the present time the price for yearlings is from 25 to 50 cents, and for older trees proportionately more. From their experience, thus far gained, they outline the treatment of camphor-trees as follows: At the age of four or five years the first cutting is made for distillation by pruning from the ground to the height at which the head of the tree is to be retained. From that time on the head is sheared in a suitable manner, without neglecting the pruning from the ground up, with the view of making the head larger. With this treatment, distillation is carried on every year, and in twelve or fifteen years the trunk of the tree will then have attained a sufficient size to be sawn into lumber, so that the valuable camphor wood may also be utilized. The trees being set fifteen feet apart, the stumps may be allowed to produce shoots until young trees have been raised and are sufficiently advanced to take the place of the old ones, when the stumps are uprooted and subjected to distillation. It will be seen that nothing goes to waste. It should be stated that the claim of the greater strength of the camphor produced in Florida as compared with the imported camphor is erroneous. The specimen exhibited has an odor differing from that ordinarily observed in commercial camphor, the odor of safrol being distinctly recognizable. After the complete separation of the volatile oil, with which the camphor is still impregnated to some extent, the properties of the latter, including odor and composition, will doubtless be identical with the corresponding properties of the camphor imported from China and Japan.

ANÆSTHETICS.

SOME INTERESTING COMPARISONS OF THEIR RELATIVE SAFETY.

At the recent international medical congress, Berlin, Dr. Horatio Wood, of America, delivered an able address on anæsthetics. He showed by charts and experiments that, contrary to the received dictum, chloroform killed by paralyzing the *respiration* as well as that of the heart and that ether ki led by paralyzing the *heart* before respiration had ceased. "The safest anæsthetic," he said, "was undoubtedly nitrous oxide. Out of 50,000 administrations only one death had occurred." Dr. Wood regarded ether as safer than chloroform by the ratio of 1 to 3 or 1 to 5. And "the best method of administering ether is by using the inhaler made of cloth stretched across the wire frame which is surrounded by rubber or leather. You want plenty of *fresh air mixed with your ether*. The reason chloroform is more fatal is probably on account of its greater specific gravity. It lies in the lungs and mixes slowly with the air and completely poisons the nerve centres before oxygen can gain admission to the blood. Ether is more volatile, and hence less dangerous. Chloroform," he said, was also less dangerous in the hot climates, probably because it was more readily volatilized. Dr. Wood cited several authentic cases where the respiration and *circulation* had actually stopped for two minutes and respiration and resuscitation accomplished. He showed drawings of pulsation and respiration, by means of suitable instruments introduced into the carotid and affixed to the chest. The heart had stopped for two minutes and respiration for five minutes, and resuscitation took place. Alcohol, either as an injection or given beforehand, is absolutely *unsafe*, and does more harm than good. Digitalis, to assist in resuscitating a flagging heart, is *valueless*." Out of many experiments performed by him he found that subcutaneous injections of *strychnine* and *artificial respiration* were the great restorative agents. He recounted many instances where recovery occurred after practicing artificial respiration for two, four, eight, and even *twenty-four hours*. "Use a moderate amount of strychnine, inject, if you will, saline solutions or ammoniacal solutions into the veins, but use artificial respiration, and you may save most of your chloroform cases."

CHILDREN'S GROWTH.

THE PHENOMENA OF THE PHYSICAL DEVELOPMENT OF THE YOUNG.

Dr. Axel Key, of Stockholm, read a very interesting paper before the recent Medical Congress, Berlin, on the development of puberty and its relation to morbid phenomena among school children. In Denmark and Sweden it has been the custom for many years to weigh and measure the school children every year. Out of 15,000 boys and 3,000 girls the results were as follows: "In the seventh or eighth year of life boys grow considerably in height and weight, after which a delay sets in which reaches its maximum in the tenth year and lasts till the fourteenth year, when a considerable acceleration of growth suddenly sets in. This acceleration lasts till the end of the seventeenth year. Its maximum is in the fifteenth year. The acceleration is at first in height and later on in weight, gaining its maximum in the latter in the sixteenth year. At the end of the nineteenth year bodily development of youth seems to end. In girls the course of development is quite different. The decrease in growth after the eighth year is not so great as in boys, and yields in the twelfth year to a rapid increase in height. The acceleration in the increase in weight comes later, but outstrips it in the fourteenth year. In the seventeenth or eighteenth year the increase is but slight. The increase in weight, however, sinks to zero almost in the twentieth year, when the growth in women may be regarded as ended." A remarkable thing, as pointed out by Dr. Key, is that boys grow faster than girls in weight and height till the eleventh year, then more slowly till the sixteenth, and then faster again. With slight variation these relations obtain all over Sweden and Denmark. In Italy and in the United States of America the period of puberty in girls ends at least a year earlier. In the spring and summer the child grows more in height, while in the autumn and winter it increases more in weight. How is it now with the health of school children during the development of puberty? It was found that 40 per cent. of the 15,000 boys in the high-schools in Sweden were ill; that 14 per cent. suffer from habitual headache, 13 per cent. from chlorosis. We ought," he concluded, "to adapt our demands on the youthful organism to its strength and power of resistance during the various phases of development, to promote the health and vigorous bodily development of youth better than we do now. I therefore endorse, from the bottom of my heart, the words which Johann Petter Frank, the father of school hygiene, uttered a hundred years ago: 'Spare their fibre still, spare the forces of their minds; do not waste the energies of the future man in the child.'"

BUSINESS NOTES.

SURA CURA.

Robinson's Sura Cura is the suggestive name of a well spoken of remedy for rheumatism, neuralgia, malaria and any disorders of the blood, as boils, pimples and eruptions. The proprietor says that sura cura cleanses the blood from all impurities and excites it to healthy action. Rheumatism is a blood disease, in which inflammation of the fibrous tissue is the most marked characteristic. External remedies should generally be avoided, as they are apt to drive the disease from one part of the system to another, often with dangerous consequences. A remedy that will purify the blood, excite the liver to healthy action, and by gentle action on the bowels carry off the poisonous secretions that cause the rheumatic pains, is what sura cura is. It contains no mineral salts, potash, acids or colchicum. It is composed of such medicines as act on the liver, blood and kidneys, and cures without leaving

the system depressed, or liable to repeated attacks of the disease. Sura cura is not a new or untried remedy, but for ten years has been thoroughly tested in all parts of the United States, and with such results as to merit the name of Sure Cure. It is a powder, put up in bottles, and in boxes for sending through the mails. Regular size, 50 cents; large size, $1.00.

CO-OPERATIVE HOUSEKEEPING.

One of the fairest dreams conjured up by Edward Bellamy in his popular book, "Looking Backward," and one which, in these days when servants are the mistresses, has a special attractiveness to every home maker, is co-operative housekeeping. To the complete building of this castle, in any more substantial material than air, is a long look ahead, but at least one or two solid blocks are even now ready for the foundation. It is claimed, and the claim is not disputed to our knowledge, that, in the manufacture of the well-known washing compound Pearline, chemical science, the most advanced mechanical appliances, and bold and sagacious business methods, are all co-operating in an eminently successful manner with the housekeeper in her difficult task of "keeping things clean." The best results, at the least outlay of time, temper and money—each one of the millions of packages of Pyle's Pearline sold every year is a practical demonstration of how to solve this difficult problem, in one direction at least.—*Boston Congregationalist.*

FOR DERANGEMENT OF THE LIVER.

use Horsford's Acid Phosphate. Dr. O. Y. Cilley, Boston, Mass., says: "Have used it extensively and with the most remarkable success. I give it in dyspepsia and in all cases where there is derangement of the liver and kidneys. With my atients it has agreed wonderfully." Horsford's Acid Phosphate imparts renewed strength and vigor where there has been exhaustion.

ARMOUR'S BEEF EXTRACT.

Walter S. Haines, Esq., M. D., Prof. of Chemistry, Rush Medical College, Chicaco, Ill., writes as follows: "Messrs. Armour & Co., Chicago, Ill., I have recently bought in the open market samples of your Extract of Beef, and of various other similar preparations including the imported Liebig's. I have submitted them to careful examination and I find your preparation the best, standing first in its physical properties (such as consistency, color and taste), and in its nutritive and stimulating value. Walter S. Haines." Chicago, December 10, 1889.

PORTABLE GAS.—An English inventor offers a system by which coal-gas, compressed to one-eighth its natural bulk, can be carried about and utilized as an illuminant when desired.

COPYING PRINT.—Printing can be copied on any paper of an absorbent nature by moistening the surface of the latter with a weak solution of acetate of iron, and using an ordinary copying press.

GREAT WEALTH.—Russell Sage is quoted as saying that Jay Gould is the heaviest owner of securities in the world, his income from dividends alone being two million dollars a year, and his other income five or six times as great. If this is true, Mr. Gould makes twelve million dollars a year, and his wealth must be far more than it has usually been estimated.

BEWARE OF THE CUP.—The cheap tinware in such extensive use all over the country is said to be absolutely dangerous, the coating of the iron being adulterated with poisonous metals, principally antimony.

BIG BALLOON.—The balloon proposed for polar explorations is 99 feet in diameter and 500,000 cubic feet in volume. The journey is to be begun from Spitzbergen, and, with a favorable wind, is expected to last four or five days.

DEATH ON ROACHES.—For the instant destruction of roaches, stir into a half pint of paste a dime's worth of phosphorus, adding, when cool, a quarter the bulk of grease. This should be placed where they frequent, and they will die while eating it.

OVER-WEIGHTED.—A good many people spoil the effect of a good night's rest by the ridiculously heavy bed-clothes they use. Old-fashioned cotton quilts, or modern Marsala ones, are very heavy and of no use, as a thin covering to protect blankets from the dirt is all that is really necessary. Bed-clothes should be like body-clothing—light and warm. Many a bad sleeper would do well to see whether his coverings are not at the bottom of his restless nights.

TUNNEL CELEBRATION.—The St. Clair River Tunnel Commission is making great preparations for a celebration on the opening of the tunnel. It is proposed to serve the banquet in the hole itself upon a table 1,000 feet long, 500 feet on each side of the international boundary, the chairman to sit exactly on the line. On the Canadian side of him will be the president of the United States, and on the American side the Governor-General of Canada, these two flanked by a string of ministers of state and notables from both countries. The tunnel will be brilliantly illuminated by electricity, and the decorations will be intrusted to a corps of special artists.

THE N. Y. HAY EXCHANGE BULLETIN.

OFFICIAL REPORT OF THE HAY AND STRAW MARKET AT NEW YORK.

COMMISSION SALESMEN.

NOTICE.

These names are arranged alphabetically.

The N. Y. Hay Exchange is located at 601 W. 33d St., corner 11th Avenue.

Only the cards of members of the N. Y. Hay Exchange appear on this page.

RULES FOR GRADING HAY AND STRAW

As Adopted by the N. Y. Hay Exchange.

CHOICE OR PRIME HAY—Shall be pure timothy, properly cured, bright, natural color, sound and well baled. No. 1—Shall be timothy, not more than one-eighth (1/8) mixed with "red top" properly cured, bright natural color, sound and well baled. No. 2—Shall be timothy, not more than one-quarter (1/4) mixed with red top and blue grass, properly cured, good color, sound and well baled. No. 3—Shall include all timothy not good enough for No. 2, proportionately mixed with blue grass, red top, and clover, sound and well baled. SHIPPING—Shall include all hay not good enough for other grades, and may be natural meadow, free from wild or bog grass, and must not contain over one-third (1/3) clover, sound and well baled. CLOVER MIXED—Shall include all hay containing not over two-third (2/3) clover, and one-third (1/3) timothy, properly cured, sound, and well baled. CLOVER—Shall be medium grown, properly cured, good color, sound, and well baled. NO GRADE OR REJECTED HAY—Shall include all hay badly cured, musty, stained, or in any way unsound.

No. 1. RYE STRAW—Shall be clean, bright, long Rye, in bundles, sound, well and securely baled. No. 2—Shall be long Rye, in bundles, sound, well and securely baled. SHORT RYE—Shall be clean, not bundled, sound, well and securely baled. OAT STRAW—Shall be clean, bright, sound, well and securely baled.

In the New York market bale-wood is weighed in without tare. In all other markets it is deducted.

These quotations for choice, No. 1 and No. 2 hay are for large bales. 5c. per cwt. less when in perpetual press bales.

The New York quotations are per cwt. At other points, per ton.

NEW YORK, Dec. 8, 1890.

The following are the market prices to-day at New York.

	New York.
Prime Hay	65c. @
No. 1	60 @
No. 2	55 @
No. 3	50 @
Shipping	45 @ 50
Clover mixed	50 @ 55
Clover	45 @
Prime Rye Straw	80 @ 85
No. 2 "	60 @ 65
Oat Straw	45 @ 50
Wheat Straw	40 @ 45

Receipts week ending Dec. 6, as follows:
Via N. Y. Central, 155 cars.
" West Shore, 122 "
Total, 277 cars.
By Barges at 34th Street Dock, 8,000 bales.

The market remains about the same as we reported in our last issue, notwithstanding that there has been quotations sent out to the effect that Prime Hay would bring 75 cents. We have failed to discover a single instance where a sale has been made at that figure, and although a little strictly fancy Hay might bring 70 cents, we do not consider it wise to make even that an official quotation. In justice to shippers generally, we make this statement, as such quotations are apt to mislead, and an unsatisfactory result sure to follow. At the same time, we do anticipate a slight advance in prices in the near future, providing the reported closing of navigation proves to be a permanent thing. This will for a time lessen the receipts and bring the trade more together at one point.

The arrivals by railroad are at present comparatively light, and no accumulation of stock on hand, although receipts equal the demand.

Rye straw is in better demand, and prices somewhat firmer owing to lighter receipts for the past few days.

Altogether, the general outlook is fairly encouraging

NOTICE.

These names are arranged alphabetically.

AMERICAN ANALYST

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CONTENTS.

A WARNING TO HEED.

Forewarned is forearmed. The Secretary of the Board of Health of the State of Illinois has published a bulletin in which he predicts that unless proper quarantine regulations are adopted there will be a serious cholera epidemic in this country next spring. He points to the fact that 10,000 people have fallen victims to cholera in Abyssinia within the last six months, that Spain is infected, that cholera is epidemic in India, and that 80,000 have perished from the disease in Japan and Corea and the adjacent Asiatic provinces of Russia within a short time. He emphasizes the necessity of protection against the scourge on the Pacific coast. Cholera, he says, has thrice followed the same route from Bekor to Alexandretta and through the Levant before the Suez Canal was constructed. This time the epidemic is being aided by the improved methods of transportation and that monument of pestilence, the yearly pilgrimage of Moslems to Mecca. Thousands upon thousands of these dirty, filthy and ignorant Musselmans congregate at Mecca and spread death and disease. They carry the infection into Syria, Turkey, southeastern Austria and the provinces of northern Africa. Cholera is there now, and its spread will soon be augmented by the Mecca crowd.

DR. KOCH'S DISCOVERY.

While it is yet too soon to declare with certainty as to the virtues of Dr. Koch's consumption cure, the indications continue to strengthen in its favor. As to the precise character of the substances that have been found to arrest the growth of the bacilli of tuberculosis, Dr. Koch has placed himself on record in a recent address before the International Medical Congress in Berlin. His remarks were on the subject of "Bacteriological Research," and may be briefly condensed as follows: "I am convinced that bacteriology will one day be of the greatest importance from the therapeutical point of view also. It is true I look for relatively smaller therapeutical results in the case of diseases with a short incubation period and a rapid course. In these diseases—as, for example, in cholera—the chief reliance will always have to be placed on prophylaxis. I am thinking more of diseases of less rapid course, as these offer more points of attack to therapeutic enterprise. And there is scarcly a disease which, partly on this ground, partly on account of its far surpassing all other infectious diseases in importance, so challenges bacteriological investigation as tuberculosis. Moved by these considerations, very soon after the discovery of the tubercle bacilli, I set about seeking for substances which could be used therapeutically against tuberculosis, and I have pursued this search (which has, of course, been often interrupted by my other occupations) perseveringly up to the present. In the belief that there must be a remedy for tuberculosis, I do not by any means stand alone. It seems to me, however, that previous investigators have not, as a rule, followed the right way, inasmuch as they have begun their experiments on man. To that I ascribe the fact that everything which people have believed themselves to have discovered in that way—from benzoate of soda down to the hot-air treatment—has proved to be a delusion. Experiments must in the first place be made, not on man, but on the parasites themselves in their pure culture; even if substances have been found which have the power to check the development of tubercle bacilli in the cultures, man should not forthwith be chosen as the subject of experiment. But the question whether observations which have been made in a test tube hold good in living animal bodies should first be settled in animals. Only if the experiments on animals have proved successful, should the method be tried on man. I have at last hit upon a substance which has the power of preventing the growth of tubercle bacilli, not only in a test tube but in the body of an animal. All experiments in tuberculosis are, as every one who has had experience of them has sufficiently discovered of very long duration. My researches on this substance therefore, although they have already occupied me for nearly a year, are not yet completed. From these researches I, in the meantime, do not draw any further conclusions than that the possibility of rendering pathogenic bacteria in the living body harmless without injury to the latter, which has hitherto been justly doubted, has been thereby established. Should the hopes based upon these researches be fulfilled in the future, and should we succeed in the case of one bacterial infectious disease in making ourselves masters of the microscopic but hitherto victorious enemy in the human body, then it will soon also be possible, I have no doubt, to obtain the same result in the case of other diseases. This opens up an oft-promised field of work, with problems which are worthy to be the subject of an international competition of the noblest kind. To give even now some encouragement to further researches in this direction was the sole and only reason why I, departing from my usual custom, have made a communication on a research which is not yet completed."

CHEMICAL SOCIETY OFFICERS.

The election of officers and directors of the American Chemical Society, held a fortnight ago, resulted as follows: President, Professor George F. Barker, of Philadelphia; vice presidents, Professors C. E. Munroe, of Newport, R. I., C. F. Chandler, New York, A. A. Braneman, New York, Elioyn Walter, New York, Edward Hart, Easton, Pa., and F. A. Genth, Philadelphia; corresponding secretary, A. C. Hale; recording secretary, Durand Woodman; treasurer, F. T. King; librarian, William Rupp; directors, C. F. Chandler, A. A. Breneman, E. Waller, L. H. Friedburg, W. McMurtie, A. H. Sabin, R. W. Hall, A. C. Hale, D. Woodman, A. P. Hallock, F. T. King, J. F. Geisler and William Rupp.

THE PHONOGRAPH IN THE HOSPITAL.

The clinical use of the phonograph has been attempted in this country, but without very great results. Better success seems to have been obtained in London. The *British Medical Journal* says that it was recently suggested that the phonograph might, with great advantage, be employed to record the characteristic changes in voice-sound of a variety of diseases, such as whooping-cough, and some forms of hysteria, and partial paralysis of the vocal cords, dependent upon pressure upon the laryngeal nerve. This suggestion was acted upon, and Dr. Felix Semon consented to select from his patients at St. Thomas's Hospital cases in which pathological varieties of phonation were present. This was carried out with great success, at a social gathering at which a considerable number of eminent medical men happened to be present, when the phonograph reproduced the characteristic vocalization of some of these diseases with the most realistic effect. The whoop of whooping-cough, with the intervening cries of the

patient were as vividly reproduced as if the child were in the room, and so also were a variety of hoarse utterances. The opinion was generally expressed that this new application of the phonograph to the purposes of diagnostic and clinical instruction constituted a solid gain for teaching, and probably for many other purposes.

THE ALASKA CENSUS.

The enumeration of the sparse population in some of the remote portions of our expansive national territory is a task of considerable magnitude. The Census Bureau has recently published a bulletin embodying a report of progress in taking the census of Alaska. It comprises a preliminary report by Mr. Ivan Petroff, special agent in charge of the Alaska division, and embodies a vivid picture of the difficulties encountered in getting results in the northernmost regions of the United States. After a preliminary trip in the mail steamer, a second trip was undertaken from San Francisco to the shores of the Behring Sea at Nushegak, in a leaky little steamer of only 25 tons burden. Special agents for different sections were appointed and sworn in on these voyages. To reach one special agent a voyage up the Nushegak River was undertaken, but failed, owing to his recalcitrant Indian paddlers. On returning to Nushegak, the U. S. Fish Commissioner's steamer Albatross took the party on board, and after six days landed them on an inhospitable shore, with a crew of Indians, mostly sick from pneumonia. The work, in spite of all obstacles, was accomplished, Mr. Petroff having divided the territory into six districts and organized a force of special agents familiar with the many languages spoken there. His journeys aggregate some 12,000 miles, while the special agents will probably travel over five times as much ground to cover Alaska's 570,000 square miles of territory.

COOKING FOR COURTS.

HOW THE VARIOUS MONARCHS OF EUROPE DINE.

The matter of food is always a distressingly coarse question, and not much can be done to either spiritualize or redeem it. But at least it may be divested of its brute aspects, and no table in the whole world is served so daintily or artistically as that of the Austrian court. Empress Elizabeth, who is a very small eater, often says that elegant surroundings, perfect ease, vast space and soft shadowy distances are absolutely necessary to preserve some illusions when we dine. Her exquisitely refined taste would prevent her from appreciating even the most delicate of meals were they not served in the most *recherche* manner; and all that priceless porcelain, unique crystal and glass, and antique gold and silver plate can do to etherealize a meal is done at Vienna, Buda Pesth, Godollo or Ishl, whenever the fair sovereign of Austro-Hungary consents to grace the one or the other of these imperial palaces with her presence. The damask is so fine that it looks like satin, and for lunch or afternoon tea is replaced by heavy white silk cloths and napkins, edged with Point de Venise and adorned with the imperial crest in raised gold embroidery. The viands are prepared so prettily that it seems almost a pity to break up and eat them, and the fairies themselves might feast on the tempting *pieces montees* prepared by the artist who presides over the imperial kitchens. Particularly I remember a dinner given in honor of the king and queen of Italy at the Hofburg, in Vienna, some years ago, as the culminating point of luxury combined with the most refined and exquisite taste. The table-cloth was strewn with forced violets, nestling so close to one another that they formed a perfect bank of fragrant blossoms, leaving only room for the plates of semi-transparent Sevres of the Famille Rose, each of which was surrounded with a thick garland of Marguerites. Marguerite being the christian name of the queen of Italy, her little namesake had been used with great profusion in the decoration of the festive board. Before the plate of each lady a slender, tulip-shaped vase of Venetian glass mounted in finely-wrought gold, contained a bouquet of Marguerites and violets, powdered with diamond dust. The menus were engraved on tin sheets of hammered silver, with the Austrian eagle embossed on the corner. Everything was served on gold dishes, and the dessert plates were a marvel of beauty worthy of Benvenuto-Cellini. When the sorbets were placed before the distinguished guests a faint murmur of admiration was audible. For even the *blase* eyes of people satiated with every form of luxury were charmed with the little double-headed eagles made of delicately spun sugar, perched on a pale pink glass ball containing a tiny electric light. On the back of each diminutive bird was a large daisy, also made of spun sugar, wherein the sorbets were served, and the gold plates on which the whole rested were garlanded with Parma violets. The dinner was really what one may describe without exaggeration as being the apotheosis of gastronomy. The dining hall, scented as with dreamy incenses, and lighted with mellow wax candles, the soft brilliancy of which would have entranced even Lucullus had he been throned there on his ivory chair, was a sight to be remembered. The inspector of the Viennese imperial kitchens, Mr. Kienberger, has held his office for over forty years, and is quite an artist in his way. His ambition consists in making each of the dinner parties at the Hofburg the most successful thing of its kind in the world, and, like a general on the eve of battle, he never leaves the kitchens and still-rooms of the palace during the last twenty-four hours before any great entertainment takes place. He personally superintends every detail, and, as he is a culinary genius himself, often concocts some particularly dainty delicacy which he alone can make. He is a great advocate of serving things up artistically, and he told me one day very gravely that he thought that a pigeon served on a gold dish was a more appetizing and pleasing viand than an ortolan sent in on a common China plate. The imperial kitchens are kept with almost military precision and regularity, and the twenty-four chefs and assistant chefs, who are under Mr. Kienberger's orders, look up to him as the officers and soldiers of a regiment look up to a field marshal. Each man has his distinct and well defined task. There is a chef for the entrees, one for the roasts, another one is the pastry cook, while the bakers, confiseurs, glaciers and dishers-up have all separate departments where they each reign supreme. Every imaginable dainty is produced at the palace, and the empress herself comes down every Monday morning when in Vienna to stroll through the kitchen to see that everything is going on as it should. Of late the art of good cooking and good eating has become even almost more than a mere art. There are restaurants in Paris, Vienna and St. Petersburg where dinner becomes a poem, and where the head chef and cellar master are personages esteemed, appreciated and known by all the aristocracy of Europe. It may be said that Bignon, of the Cafe Riche at Paris, is second to none as a prince among restauranteurs. Not one of the foreign potentates who yearly congregate in the French capital would dream of neglecting to look in at Bignon's and pay tribute to his genius, although they think twice before consenting to make their far less agreeable duty-call upon President Carnot at L'Eysee. Bignon's, on the Boulevard des Italiens, is still the rendezvous par excellence of all the true gourmets, as well as the creme de la creme of Parisian society, who are regular frequenters of the place. In short, Bignon's is an institution whose name and fame will descend to posterity first on the list of cosmopolitan gastronomy. The elder Bignon, who owns the Cafe Riche, is as wealthy as Crœsus, and has castles which are by no means confined to the air. He has made a great fortune, indeed, by catering to the jaded and *blase* palates of all the wealth, beauty and distinction of the world, who, for half a century have feasted on the inimitable dishes provided for them by the presiding "maestre."

The "Chaumiere," in Moscow, is certainly the most luxurious and elegantly appointed restaurant in Europe. The large dining-hall is a huge winter garden, with feathery and blooming mimosa as a background for the exquisitely served tables. In the middle of this unique restaurant garden is a great marble fountain wherein trout and other delicately flavored members of the finny tribe swim in deep, clear water. When a guest orders a fish for his dinner he is forthwith conducted by the head butler to this novel aquarium, and is requested to select the fish most likely to tempt his fancy. A long-handled silk net is then given to him, and he can, if he pleases, catch his fish with sportsmanlike zest and dexterity—a feat which materially adds to his enjoyment and general appreciation of the dinner he is about to eat. Russians, who are very fond of flowers, do not relish a repast when the table is not one mass of fragrant blossoms, and nowhere else in Europe does one see such gorgeous table decorations as in St. Petersburg or Moscow. Thousands of rubles are often spent for rare orchids to adorn the board of some wealthy Boyard, and at the dinner given some time ago by Prince Narishkine to the diplomatic corps at St. Petersburg the flowers in the dining-hall cost over 20,000 rubles. Eduard Sacher, at Vienna, is known to be the most aristocratic of restauranteurs. Crowned heads have dined in his cabinets particuliers, and every night after the opera is over all that the Austrian capital contains of titled and noble personages flock to his restaurant to partake of the gastronomic curiosities which he prides himself in setting before his guests. There you can get strelets from the Volga, eels from the Tiber, grouse from Scotland, bustards from Sweden, bear's paws from the Black Forest, turnips from Teltow, melons imported from Greece. You may, if your purse is a long one, order peaches in December and partridges in July, for Sacher knows not the word impossible. His cellars are admirably stocked with wines from every country in the world, and when I last dined there the great Eddy Sacher himself offered me a bottle of Johannisberg a hundred years old for the modest sum of 200 francs ($40). I declined, and felt no regret when I sipped the mellow Pichon-Longueville 1848, which was sent in with my dinner. A feature of Sacher's restaurant is the elegance of the service, the plates and dishes being of finest Dresden, the glasses from Baccarat, the silver antique and massive, and the damask faultless. The cabinets particuliers are beautifully upholstered in pale blue plush, and groups of flowers and foliage fill every nook and corner. Among the fastidious gastronomes of our time is M. Carnot, the President of the French Republic. He possesses in Louis Tabenar, his chef, a treasure of rare value.

Tabenar has four regular assistants and twenty-five occasional helpers, together with an army of marmitons. He is the inventor of the famous "Poulet a la Carnot," a chef d'œuvre almost worthy of the red ribbon. He, however, jealously keeps the recipe for this dish, and is justly proud of the many compliments this creation has brought to him.

Among the monarchs of Europe there are but few real gourmets, and according to a recent chronic the tastes of the sovereigns of the world are of the simplest. The Emperor of Russia has a great liking for ham and eggs at breakfast and roast beef and poultry for dinner, all washed down with copious cups of caravan tea. Queen Victoria favors the Scotch cuisine, including porridge and the dish of haggis. The Queen of Sweden's favorite plate is salmon and her only beverage claret and water, while the Queen of Spain dotes on black currant jam. The Duc d'Aumale breakfasts every day on garlic soup, and as to the King of Italy he is a strict vegetarian. Two anecdotes will serve to show how subservient a gourmet can become to the chef experienced in all the peculiarities and caprices in taste of the master to whom his art is consecrated. The Marquis de Talhouette, who was not only a gourmet but a gourmand, was horrified when his chef refused to follow him to a new country residence which the nobleman had bought. "Why do you refuse to come to the chateau?" he inquired of his culinary artist. "Monsieur le Marquis must pardon me, but no one belonging to the household plays sufficiently well at billiards to become my partner at the game." "Very well, Durand," retorted the marquis, "I, myself, will play billiards with you every evening if you will consent to stay with me in the country?" This was respectfully agreed to by the chef, but a month later he tendered his resignation anew, on the ground that the marquis did not play as well as he had expected he would. Thereupon M. de Talhouette closed up his chateau and returned to Paris, so as not to lose his valued chef de cuisine. While the Duc de Morny was Prime Minister during the reign of Napoleon III., his chef de cuisine and his chef de cabinet—who was an aristocratic member of the diplomatic corps—had some difference of opinion about the bills presented for payment. The chef, in high dudgeon, rushed to the Duc's study, and, untying his apron, flung it on the writing-table of the great statesman. "Your Excellency must choose between Count —— and myself. If he remains here I shall leave to-day." The startled duke inquired into the case and then dismissed his chef de cabinet, giving him a prefecture by way of consolation. "Ah!" exclaimed the latter to his friends, "it is easy enough to find a chef de cabinet, but a chef like Jerome!—there are only three in Paris."

MADAME MARIAZOLI.

WOMEN'S WORK.

WHAT SOME PENNSYLVANIA WOMEN ARE DOING.

Nearly every man, woman, and child in Sullivan county knows Miss Harriet Bronson, her cream-colored nag, and her two-wheeled gig. At one time or another during the year Miss Bronson visits all the farm houses and every accessible backwoods cabin in the county, and her coming makes a break in the monotonous lives of the busy housewives wherever she goes. Miss Bronson is a little middle-aged maiden, full of good cheer. She is following the same occupation that her father, the late Ansil H. Bronson, did for many years. With a kit of tools in her gig, Miss Bronson hitches up her cream-colored horse and starts from her home on Elk Creek on journeys of five and six weeks' duration through the surrounding country. As she jogs along over the rough and generally rutty roads, the plucky little woman's outfit is picturesque. "Hat Bronson's rig," as the country people call it, can be recognized as far as it can be seen. Miss Bronson reins her horse up at every dwelling, and it is a rare thing for her not to find some kind of a job to do at each house. If her approach has been heralded to the housewife by the ever watchful children, as is usually the case, the crippled household articles that Miss Bronson has a knack of straightening up are all ready for her to go to work on the moment she steps over the threshold. If there is a clock in the house that has become balky, Miss Bronson soon tinkers it up so that it will run right along and keep accurate time. Leaky tin ware she solders up as nicely as a city tinsmith could do it, and if there is any broken crockery in the house she fixes it up with cement. She regulates gunlocks that have got out of kilter, hones razors like a barber, and sharpens scissors and shears. Something of this kind needs to be done in nearly every dwelling on each of her trips, and Miss Bronson's arrival is looked forward to with as much eagerness by the country people as is that of the mail carrier. She picked up the trade from her father, and the rig she drives is the same one that her father drove until four years ago, when he died. Whenever there is snow on the ground Miss Bronson hitches her nag to a little bob, bundles herself up warm, and rides over the hills on runners. On Willow Creek, in Sullivan county, the Misses Caroline and Emily Brockway have made a little more than a good living out of Bee Culture for nine years. At the time of their father's death, in 1879, the Brockway girls lived in Wyoming county. Their mother died several years before, and they were the only children. Mr. Brockway willed to his daughters a tract of timber land on Willow Creek, and in 1880 the enterprising spinsters hired some woodsmen to chop down a few acres of the forest and build them a log house on the clearing. In the spring of 1881 they moved into the rude habitation, taking a cow, a few hens, and a good watchdog with them. Before they had settled there the plucky sisters had made up their minds what they were going to do to get a living. It was an excellent place in which to keep bees, because wild flowers were abundant on the neighboring hillsides in summer time, while not many miles away white clover and buckwheat fields were numerous, and the women began business with ten hives. They had had some experience with honey bees at the old home, and during the previous winter they had gathered all the information they could from experienced bee keepers in Wyoming county, and had read all the literature on bee culture that they could get hold of. So well did their bees do during the summer that they bought half a dozen hives in the fall, and these, together with the new swarms, were wintered in a slab building that was kept warm by wood fires in two stoves. The third year Caroline began to devote her entire time to the bees, while Emily took care of the garden and looked after the affairs in the house. It had been decided that a division of duties was the proper thing, and they found that it worked well. Once a month a man came around and bought what honey they had on hand, paying cash for it, and at the end of the fourth season the girls began to lay up money. Four hives perished the next winter, and they started in on the following spring with forty-three colonies. Now they have nearly eighty hives. Two years ago the energetic sisters built a nice little cottage, and since then they have used the log house as a winter home for their myriads of honey gatherers. "Living so near the woods, don't you frequently lose a new swarm?" a visitor asked Miss Brockway this fall. "I haven't lost on an average one swarm a year," she answered. "I always have a pail of sand handy, and as soon as a swarm comes out I throw two or three handfuls of it among them. The sand weighs them down, and they have no desire to fly any further than the first object that seems to them to be a safe spot to settle on. If I am quick in sprinkling the swarm with sand I have no fear of losing the bees. It makes them alight much sooner than any noise or concussion under them, and it is a cheap and easy way of calling the swarm to a halt. I wasn't paying proper attention to my duties one day last summer and I lost a young family on account of my negligence. The bees were too far above the ground when I first saw them for me to reach them with the sand, and they sailed off in spite of me. A woman who knows how to shave shingles lives on Trout Run, Tobbyhanna township. She is the widow of a woodsman named Erastus Coleman, who died three years ago. Coleman was a shingle maker, and he left his wife with three small children and a boy thirteen years of age. The boy helps his mother saw logs into blocks of shingle length, and Mrs. Coleman splits the blocks and shaves shingles out of the timber. On hot days in the summer and fall the Widow Coleman, who has not yet reached the age of forty, plies her drawing knife to the soft wood in the shade of a big elm tree, turning out shingles as fast as any woodsman in the township. The ground under the tree is a foot deep with shavings. When the weather is cold or stormy Mrs. Coleman works in a board shanty. She and her son pack the shingles into bunches, and a neighbor carts them to the nearest railroad station, where they are sold. By making shingles and raising geese the industrious widow gets a comfortable living for herself and children. She raises from eighty to hundred goslings every season, and she has a good lot of live feathers and fat young geese to sell when winter sets in. She cultivates a little garden patch, and she keeps two cows, a pig, and a flock of hens.—*The Nightingale.*

BOOK OF REFERENCE.—Fraulein Marie Essipoff has received as a wedding present from her father, a wealthy Viennese merchant, a book, which is said to be the costliest volume in existence. The binding is of the richest tooled morocco, and each of the one hundred leaves is a bond for one thousand gulden.

ASIATIC WOOL.—A syndicate of French merchants has bought 100,000 poods of wool in Usoon-Ada. The company proposes to establish large ranges of Russian, Spanish, and French sheep in the prairies of Karakool and in the oasis of Pendensk, with the view of raising the finest wool in Central Asia.

AFRICAN COAL.—Not long ago South Africa had to import all the coal she used, but now she mines all the coal she wishes for her own use and exports the surplus. The reason is that the coal fields of Natal have increased their output to a remarkable degree. The railroad managers say they are saving $250,000 a year by using coal that is produced at home.

TOUGH FOR WOMEN.—Flossie is six years old. "Mamma," she asked one day, "if I get married will I have to have a husband like pa?" "Yes," replied the mother, with an amused smile. "And if I don't get married, will I have to be an old maid like aunt Kate?" "Yes." "Mamma"—after a pause—"it's a tough world for us women, ain't it?"

ARMENIAN PAPERS.—There are thirty-four periodical publications in the Armenian language. Nineteen of these are issued in Turkey (eighteen in Constantinople and one in Smyrna). Their contents are political, literary, belletristic, humoristic and juvenile, illustrated respectively. In Russia there are eight of these publications, among which there are two daily papers, three monthly magazines, and one illustrated weekly. In London three Armenian papers appear and Austria, Italy, France and America have one Armenian paper each.

ENCOURAGING.—"The table manners of the traveling public are improving," says an old traveler. "Whether this is due to the general spread of civilization or to the ameliorating influence of the dining car I don't know, but I think that everybody is growing more and more thoughtful and polite. Of course, there is still some lively hustling done at eating stations, but it is nothing like what it used to be in the old days, when folks reached for things. Then you wouldn't have been surprised to see a man carry a pitchfork to spear biscuit with at the other end of the table, but nowadays most travelers seem to have discovered that it is much more comfortable for themselves and for everybody else as well to politely ask a neighbor, or better still, to ask a waiter, for whatever they may want that is not within easy reach."—*Sun.*

CORRESPONDENCE.

A BACKWARD MOVE.

LONDON, *November* 26, 1890.

Editors, AMERICAN ANALYST:—No recent event in the United States has so astonished and shocked the medical profession of London, as the expulsion of Dr. Roberts Bartholow from his famous chair in Jefferson College by the authorities of that institution on account of his profound belief in electro-thereapeutics. His writings have been text books here as in America, and his researches and discoveries in the application of electricity to disease have already built up a great school of specialists in Great Britain. To his efforts more than to any one else are due the use of the galvano-cautery, the removal of birthmarks and other external disfigurements by electrolysts, the treatment and cure of many disorders by the continuous current and what seems to be the cure of that most dreaded disease, cancer, by electrolytic action. When he started his work in this field, the term, medical electrician was one of reproach. No physician owned a battery or could tell a galvanometer from a telegraph pole. To-day, thanks to him, electro-thereapeutics is a recognized science, and every physician of even the lowest standing is more or less familiar with its laws and principles. For the Jefferson authorities to remove is about as disgraceful as it would be for some high school to censure Edison for revolutionizing acoustics with the phonograph or for Edinburgh to prosecute Dr. Lister for his work in antiseptic surgery. The motives that underlie the action are easily seen. Professional jealousy is one. Bartholow is experiencing what Pasteur, Wells, Lister, Von Baer, and other mental giants underwent before him. Hide-bound intolerance or old fogyism is another. A large class of practitioners would rather lose a patient than spend two years in studying a science which would cure him. Greed probably is the leading motive. The surgeons who received vast fees for delicate and dangerous work are bitterly opposed to a system, which cures cases once their own, exclusively, simply, rapidly, painlessly and cheaply. I do not charge these motives to the authorities of Jefferson, but to an unknown set of men, whose consensus of opinion has induced those authorities to act as they have done. Saddest of all, they do not realize that their action puts that famous institution of learning back half a century.—*G. C. Davidson, M.D.*

CUI BONO?

MARK TWAIN—A SKELETON—AND A KIND-HEARTED DRUGGIST.

Mark Twain was present at the banquet of the National Wholesale Druggists' Association at its recent meeting in Washington, and in return for his dinner related the following story:

About a thousand years ago, approximately, I was apprenticed as a printer's devil to learn the trade, in common with three other boys of about my own age. There came to the village a long-legged individual of about nineteen, from one of the interior counties: fish-eyed, no expression, and without the suggestion of a smile—couldn't have smiled for a salary. We took him for a fool, and thought we would try to scare him to death. We went to the village druggist and borrowed a skeleton. The skeleton didn't belong to the druggist, but he had imported it for the village doctor. The price of the skeleton at that time was $50. I don't know how high they go now, but probably higher, on account of the tariff. (Laughter.) We borrowed the skeleton about nine o'clock at night, and we got this man—Nicodemus Dodge was his name—we got him down town, out of the way, and then we put the skeleton in his bed. He lived in a little one-storied log cabin in the middle of a vacant lot. We left him to get home by himself. We enjoyed the result in the light of anticipation; but by-and-by we began to drop into silence; the possible consequences were preying upon us. Suppose that it frightens him into madness, overturns his reason and sends him screeching through the streets. We shall spend sleepless nights the rest of our days. Everybody was afraid. By-and-by it was forced to the lips of one of us that we had better go at once and see what had happened. Loaded down with crime, we approached that hut and peeped through the window. That long-legged critter was sitting on his bed with a hunk of ginger-bread in his hand, and between the bites played a tune on a jew's-harp. There he sat perfectly happy, and all around him on the bed were toys and jim-cracks and striped candy. The darned cuss, he had gone and sold that skeleton for $5. (Laughter.) The druggist's fifty-dollar skeleton was gone. We went in tears to the druggist and explained the matter, We couldn't have raised that $50 in 250 years. We were getting board and clothing for the first year, clothing and board for the second year, and both of them for the third year. But the druggist forgave us on the spot, but he said he would like us to let him have our skeletons when we were done with them. There couldn't be anything fairer than that; we spouted our skeletons and went away comfortable. But from that time the druggist's prosperity ceased. That was one of the most unfortunate speculations he ever went into. After some years one of the boys went and got drowned; that was one skeleton gone, and I tell you the druggist felt pretty badly about it. A few years after another of the boys went up in a balloon. He was to get $5 an hour for it. When he gets back they will be owing him $1,000,000. The druggist's property was decreasing right along. After a few more years the third boy tried an experiment to see if a dynamite charge would go. It went all right. They found some of him, perhaps a vest-pocketful; still it was enough to show that some more of that estate had gone. The druggist was getting along in years, and he commenced to correspond with me. I have been the best correspondent he has. He is the sweetest-natured man I ever saw; always mild and polite, and never wants to hurry me at all. I get a letter from him every now and then and he never refers to my form as a skeleton, says: "Well, how is it getting along—is it in good repair?" I got a night-rate message from him recently—said he was getting old and the property was depreciating in value, and if I could let him have a part of it now he would give time on the balance. (Laughter.) Think of the graceful way in which he does everything—the generosity of it all. You cannot find a finer character than that. It is the gracious characteristic of all druggists.

AGATES.

HOW THEY ARE CUT AND POLISHED IN EUROPE.

Between Oberstein and Idar says a writer in *Blackwood*, we catch sight of the first of a number of lovely little buildings standing at intervals up the river in the middle of the meadow, and, as it were, in the water. They are nearly square in shape, with many windows, and the broad silvery slate roof slopes down nearly to the ground on either side, recalling the outspread wings of a gray pigeon. Each has a huge water wheel, turning at a tremendous rate and throwing bright drops on a very garden of wild flowers; meadow-sweet and purple loosestrife, river forget-me-not, and lovely pink mallow, and the velvety lemon spikes of the greater mullein. The precious stones are cut and polished in these mills, and to step outside of this sunshiny, flowery world into one of them is but for the courtesy and friendliness of the workers, a little like stepping from Paradise into the Purgatorio. Three or four huge millstones about six feet in diameter and a foot to eighteen inches thick, are turned vertically by an endless band at about the rate of three revolutions in a second. Before the revolving edge of each lie two men, extending face downward on a long wooden block, or horse, their feet set against stretchers, to give them the necessary purchase on the millstone. The stones make a hoarse roar, which mingles with the stamping of the water wheel and the rush of the water outside. The men with their pale dusty faces downcast, hold bits of oynx or amethyst or tiger eye pressed with all the weight of their body and the strength of their muscle against the remorsely descending surface. The agate hisses and crackles under its tribulation, and becomes red and glowing, and often a large piece becomes most beautiful, transparent and luminous, and, as it were, incandescent all through. Mountain islands in the west country appear to grow like that between the beholder and the settimg sun sometimes. Sawing the rough blocks and the crystals and the final polishing are done at other machines in the same room. The stream falls about five hundred feet in seven miles, and the water-power seems to be about one-horse power to the foot of the fall. It is regulated by sluices and turbines, and the stream is broken up into bright miniature mill-races, or gathered into little lakes. All along the valley the water flashes in and out of the meadow, and there are nearly seventy of the mills, sometimes ten or more in a mile, with their broad silvery and white-washed walls and merry water wheels.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

December.

MEATS.—Beef, mutton, pork, venison, veal.

POULTRY AND GAME.—Chickens, fowls, ducks, geese, turkeys, grouse, capons, hare, partridge, pheasants, rabbit, pea-fowl, guinea-fowl, snipe, widgeon, wild duck, woodcock.

FISH.—Brill, carp, cod, crabs, perch, salmon, smelts, soles, sprats, tench, turbot, whiting, halibut, sturgeon, oysters.

PRACTICAL RECIPES.

POTATO AND ONION SOUP.—Slice and fry in two tablespoonfuls of butter three small onions; when brown add a tablespoonful of flour, and then gradually add three pints of stock or water; cut in pieces four potatoes and cook them in the soup until soft; strain through a sieve. If the soup is made with water, add one and a half cups milk. Let the soup come to the boiling point, then add a beaten egg and a little butter; do not let it boil again, but season and serve, adding two tablespoonfuls of minced chives or parsley just before dishing. Serve with snippets of fried bread.

BUTTER BISCUIT.—One and a half pounds flour, four tablespoonfuls butter, one pint sweet milk, one-half teaspoonful salt, one-half teaspoon soda dissolved in a little hot water. Rub the butter well into the flour, add the other ingredients and knead thoroughly, roll out into a sheet a quarter of an inch thick and cut into small cakes; prick them with a fork and bake in a moderate oven.

BOILED LEEKS.—Select very young ones; trim off the roots, outer leaves and green ends, and cut the stalks into even lengths; tie them in bundles and cook for forty-five minutes in boiling water, in which there is a tablespoonful of vinegar and a desert-spoonful of salt. Drain, and serve like asparagus on toast with drawn butter.

RICE BLANCMANGE.—Mix one quarter pound ground rice with a pint of milk. Put in a saucepan one pint of

milk, three tablespoonfuls of sugar, and a lump of butter; when it boils add the rice and milk and boil steadily for ten minutes, stirring all the time; flavor with vanilla and pour into a mould; when cold serve with custard or stewed fruit.

COCOANUT CHEESE CAKES.—Grate the white meat of a good-sized cocoanut and put it into a stone dish; add the milk from the cocoanut, two cupfuls of sweet milk, and three-quarters pound of white sugar; stew till tender over a moderate fire, stirring steadily; when tender take off the fire and let it cool, then add six well-beaten eggs and a dozen almond macaroons or stale lady-fingers, crumbled. Mix well. Line your patty-pans with puff paste, and fill with this mixture. If it should be too thick, thin a little with cream or milk.

CANDIED NUTS.—Shell some English walnuts and hazel nuts; put one pound granulated sugar into a bright kettle, and cook with one-half cup boiling water until it feathers; then add two tablespoonfuls vinegar, and boil until brittle in cold water. Watch carefully until it becomes slightly yellow, then set the kettle in a dish of boiling water; take a nut on a kitchen fork, dip it well into the candy, using care not to disturb the mass or it will granulate, and lay it on greased paper. Work quickly so that the sugar may not get too hard.

EGGS WITH ONION.—Slice a fine Spanish onion and fry it in butter; add some hot milk, pepper, salt, chopped parsley and a little butter; thicken with flour. Slice some hard-boiled eggs, add them to the sauce and serve, garnished with bits of toast.

JULIENNE POTATOES.—Peel and cut in slices like matches some raw potatoes, fry in boiling lard, drain, dust with salt, and serve.

RHEUMATISM AND GOUT.

There was truth as well as humor in the remark of the wit who said "rheumatism is the poor man's gout, gout the rich man's rheumatism." The two ills are members of the family which also includes inflammatory rheumatism, lumbago, rheumatic gout, calcareous deposits, neuralgia, sciatica and other lesser complaints. Examined under the naked eye, none of these maladies show more than a local inflammation of greater or less severity, or a curious formation of lime and human tissue, which at times suggests the idea that the sufferer has eaten chalk, and that nature is endeavoring to expel the strange food through the skin or out at the joints of the member. Before the chemist and the microscopist lent their aid to the physician, but little was really known of these diseases. The mediæval doctor solemnly declared the patient to be suffering from phlogiston (a curious Greek phrase for the principle of heat), and prescribed vast quantities of anti-philogistics. An anti-philogistic in those days meant any drug which would make a person deathly sick, and so cool him off through sheer failure of the vital powers. Under such treatment the sufferer either died or rapidly recovered. He usually took the former course, and was then piously but lyingly declared to have been taken away by the act of God. Modern science has changed all this. Under the microscope the swollen and agonizing tissues disclose the presence of minute points and crystals of chemical salts. In rheumatic trouble these salts are usually uric and hippuric acids, and other similar bodies; in gouty ailments the crystals are larger and sharper, and consist of urate and hippurate of lime, choleate of lime, carbonate of lime as well as those bodies which accompany rheumatism. The latest researches concerning neuralgia tend to show that the awful anguish of that disease is occasioned by the irritation of nerves and ganglia by the presence of extremely minute foreign bodies of the same class as those described. The lesson of the microscopist is made complete by that of the chemist. He first analyzed the offending substances, and then found that they were all contained in the blood; that most of them were produced by the wear and tear of the system, while a few were taken directly from many articles of food. What was of greater importance, he showed that in health the pores, bowels, liver, and, above all, the kidneys removed these substances from the system, while the lungs aided to an appreciable extent by burning a considerable quantity of them by means of the action of the blood; that in ill-health, on the other hand, these excretory and destructive processes worked insufficiently or morbidly; that in some instances they clog up the kidneys and pores, in others interfere with the action of the liver, and in all cases they accumulate in the blood until they reach a point where they must be separated from the life-current if the latter is to continue. At this point nature choses between two evils and selects the lesser. The uric and similar compounds are separated, crystallized and deposited in the muscles, on the joints or near the nerves. Sometimes they are deposited on the walls of the stomach, kidneys and bladder, but in such instances a different class of diseases is brought into being. While the process is extremely painful, the blood is temporarily purified, and the system relieved, just as a patient feels better after a severe diarrhœa. The great central fact, it will therefore be seen, is that the real cause of rheumatism, gout and their hideous kindred lies in the accumulation of impurities or humors in the blood. Anything that will dispel these from the circulation will cure the resulting ailments, and if taken in time will prevent their ever occurring. This is best accomplished by Ayer's Sarsaparilla. The preparation famous in every land is a simple, scientific blood purifier. Its action is two fold—it stimulates and tones up the vital organs, and it incites the blood vessels to greater activity. After it has been used a short while the blood becomes normal, and then, in turn, attacks the impurities that have been deposited, dissolves and expels them in the usual manner. Better than all cures, it is an absolute prevention. He who takes Ayer's Sarsaparilla properly will never suffer from the diseases we have just discussed.

BUSINESS NOTES.

PROF. KOCH.

HIS CURE FOR CONSUMPTION BY INOCULATION.

That there can be no broader field of research for medical science than Bacteriology, comprising as it does those tuberculous diseases to which the learned Dr. Koch is giving his attention, is admitted by all physicians. When one remembers that over half a million victims annually fall before this terrible scourge, and that every eleventh family, on an average, furnishes a subject to recruit the ranks of the great host suffering from tubercular consumption, it is not to be wondered at that so profound an interest is felt in the investigations of the learned German physician. The farthest Dr. Koch is yet able to extend his work proves his discovery of much value for tubercular lupus and tuberculous affections of the joints, where the surgeons can remove the tuberculous tissue, which has been killed as result of inoculation with the lymph, and in which the bacilli have been active; where this dead tuberculous tissue remains, as in phthisis, it is as yet impossible to say how valuable this discovery will prove; and as the tissue cannot be removed by the surgeon's knife, it is not improbable that from this the bacilli may migrate to the live tissue in immediate contact. As it now presents itself, the work of Dr. Koch, in discovering this bacillus and the lymph for diagnosing tuberculous diseases, has made a name and reputation to which a tribute of honor will be offered second only to the immortal Dr. Jenner. While the physician can understand the action and the result to be relied upon in using vaccine virus as well as the method of its manufacturing, this has yet to be learned with the lymph being used by Dr. Koch, and it will require many years of experiments to demonstrate how valuable this discovery may prove. It is therefore probable that those who look for an immediate and unfailing cure for tubercular consumption will meet with disappointment, unless they find it in the use of Scott's Emulsion, the curative agent that has already done so much towards relieving the terrible fatality of phthisis. Physicians have not been slow to acknowledge the wonderful remedial value of Scott's Emulsion of Norwegian Cod Liver Oil with Hypophosphites, as it has proved a reliable cure in all forms of wasting diseases and consumption, when treated in the early stages; as also for severe colds or coughs. It not only heals where disease has made its inroads, but it fortifies and builds up the vital tissues, giving strength and vigor to the weak and emaciated with marvellous rapidity. In Scott's Emulsion the ingredients have been made known to every physician and chemist, and hence many unscrupulous persons, without experience or knowledge, have imitated the medicine. The skilful manner of compounding, and the purity and excellence of the ingredients, have always characterized Scott's Emulsion and made its value acknowledged throughout the entire civilized world, wherever the physician has to combat these diseases.

BUFFALO LITHIA WATER.

TESTIMONY AS TO ITS SOLVENT POWERS.

The following, reprinted from the *New England Medical Monthly* for November, 1890, bears unmistakable testimony to the solvent properties of the Buffalo Lithia Water:

"I must confess that I was skeptical as to the value of this mineral water as a solvent of stone anywhere, either in the bladder or kidneys, but after seeing some of the statements recently published in the columns of your valued paper, I felt that in the future, if I did not use it, I would not be doing justice to my patients. I little thought at the time I came to this conclusion that I should so soon have such a remarkable example of its solvent powers. I tried it on a case of renal colic which nothing seemed to relieve permanently, and which, upon the administration of Buffalo Lithia Water yielded like magic. But this case was but child's play beside the one which I will now relate. Before I do so, however, I wish to state that when the patient came to me I had no idea of the extent of his trouble, and I now can see where obscure symptoms were not carefully analyzed, and were overlooked entirely by other doctors, whom he had appealed to for relief. Mr. S., American, forty-seven years old, on being questioned, says, that he has never to his knowledge had nephritic colic in his life. During the past twenty years, once or twice during each year, he has had an attack which has been diagnosed as peritonitis, typhilitis, colic, inflammation of the bladder, and various other diseases. He describes his symptoms as follows: He would wake up in the morning as well as he ever was, in fact a few days before the attack he would feel in better spirits than usual, and would seem to be more buoyant. Some time during the day, may be during the morning, during the afternoon, and sometimes during the evening, he has commenced suddenly to have a severe pressing sensation in the bowels. He has been to the doctor many times and had him pass a catheter into the bladder, in order that he might have ocular demonstration that there was no water in it. These symptoms were accompanied with great restlessness, and sometimes ushered in by a chill and high fever, and at other times by no accompanying symptoms whatever. During the time of his distress he was not able to sit or lie down at all, but would walk about, trying in vain every few moments to secure alleviation from pain. After having this suffering for from one to six hours, his relief would be as sudden as its onslaught, and complete until another attack. His pain in the bladder was always on one side of the neck. These phenomenas had existed, as I said before, for full twenty years, and he had had a variety of treatments prescribed for him by as many doctors; but with certain regularity he had continued to have his attacks. About two years ago, after experiencing one of his most severe attacks, he noticed that the irritation on the right side of the neck of the bladder continued and was more and more persistent, and gradually increased until his sufferings became very great. He was supposed to have had at this time, as was so diagnosed, cystitis and enlarged prostate. Four months ago he consulted with me, and I advised that his bladder be explored for foreign body, which I was sure was present. On attempting to pass into the urethra, I found it so sensitive that it was impossible for me to make any progress without the use of an anæsthetic, and chloroform was accordingly administered, preceded by a good big dose of whiskey, my invariable custom when administering this anæsthetic. On entering the bladder I encountered a large mass, which, from the characteristic click, I decided was a stone. It was something immense, and larger than anything that I had ever known of or heard about. The day after the exploration I had a long talk with him, telling him that he had a large stone, and advised him to have an operation performed for its removal, as I did not believe that anything else would do him any good. He was very

despondent, and refused to talk about an operation at present, asking me to give him something for temporary relief. I prescribed Buffalo Lithia Water, a goblet four times a day, and a good liberal diet together with tonics. In three days time he called me to see him, and asked me if the debris that I saw was not disintegrated stone. I was amazed to see the quantity of brick-dust or rather iron rust looking deposit which was present. This material kept coming away, and sometimes large particles came from time to time. All of the larger ones were saved. After all were passed, which took three and one-half months, the large particles which were saved weighed two ounces and twenty-seven grains. What passed beside this could not be estimated. Chemical examination showed it to be entirely of the triple phosphate variety. What this man must have suffered I will leave you to imagine, but he is now well, and to-day I passed a sound into his bladder without the slightest difficulty, and found it entirely free. The Buffalo Lithia Water in this case certainly is entitled to the credit of a cure, and saving this man from a perilous operation." G. H. PIERCE, M. D.

Danbury, Conn., Oct. 10, 1890.

PROFESSIONAL CONFIDENCE.—A perplexing suit, involving professional secrecy, has been before the Paris Society of Public Medicine. A suburban practitioner, called in to attend a patient suffering from scarlet fever, advised the landlord to disinfect the house. This was done, and the landlord sued the patient to recover the cost. The patient thereupon sued the doctor for breach of professional secrecy, and it is thought that he will win his case.

GERMAN WISDOM.—Nearly all the school-houses in Germany have connected with them gymnasiums, work-rooms and libraries, while many are provided with bath-rooms supplied with hot and cold shower baths. It is found that the children's freshness and enjoyment of study are greatly promoted by occasional showers. Another novelty of the newest school buildings is prison cells for refractory pupils.

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CONTENTS.

SORGHUM SUGAR.

The chief chemist of the government Agricultural Department has published an account of a process recently perfected at the department as the result of experiments in the chemical laboratory, with reference to the manufacture of sorghum sugar. The chemist claims substantially an increase in the yield of sugar per thousand gallons of juice from an average of about 10,000 pounds to an average of over 21,997, at an increase of cost of production of $84 for the alcohol which enters into the new process. The report of the chemist recites some of the difficulties hitherto found in an economic manufacture of sugar from sorghum, and indicates that the solution of the question was to be found in some process which would separate as nearly as possible the gummy amorphous bodies from the juice without precipitating the sugar. The known property of alcohol to produce precipitation in the juice was made use of in the further study of this problem. Not only has the removal of the gums been effected by the process evolved during these experiments, but it has been shown that this can be effected at a cost comparatively trifling by comparison with the results obtained. By this process, the report argues, the period of manufacture, the shortness of which has always been one of the troubles in the making of sorghum sugar, can be considerably lengthened. In order that the new method of production may become possible the report suggests the necessity for a modification of the revenue laws, so as to allow the preparation of the alcohol used in the process to be carried on without tax, to be made under bond given by the manufacturer that it shall be used only for this purpose, and the apparatus for making it to be erected by the manufacturer, and to be under the direct inspection of revenue officers. It is urged that the department should at least be permitted to carry on experiments on a small scale with this method in the experimental stations for the improvement of sorghum cane, and the manufacture therefrom, and it is estimated that a grant of $20,000 would be entirely sufficient. This recommendation is endorsed by Secretary Rusk.

AIRY ALUMINUM.

At no period in the world's history has the caution of Horace to "let nothing surprise us" been so applicable as it is to the present generation of men. There are possibly persons still living who, in the early part of the present century, witnessed the successful application of steam to navigation, and it was only in 1826 that the first railroad was built in this country. The remembrance is still fresh of the excitement which the success of these great inventions occasioned, and of the incredulity with which its announcement was received. Now there is presented to our contemplation a project that heretofore has seemed as chimerical as either of these appeared to our fathers and grandfathers, in the shape of a plan for aerial navigation. We read in the Chicago *Herald* a report of a meeting held in that city on December 10th of the directors of the "Mount Carmel Aerial Navigation Company," at which a Mr. E. J. Pennington, the inventor, announced that an air-ship now being constructed at Mount Carmel will be completed before the first of next month, and that the first trip is to be made to St. Louis, thence to Chicago and New York, carrying the inventor, the board of directors, and representatives of the press. Such an announcement will be received with several grains of salt, yet it is relatively no more startling or improbable than many others which have been verified during the century. There are many things that give an air of extreme probability to the announcement that man is about to achieve another conquest over space, for it is claimed the new ships will make at least 200 miles an hour, or more than four times the speed of our fastest railroad trains. In the first place, the new ships will be constructed almost wholly of aluminum, one of the lightest and strongest of metals. That we are about entering on an age of aluminum scarcely any chemist or inventor doubts. One Chicago chemist has already announced a new method of manufacturing it, and another practical engineer is getting ready to begin the manufacture of aluminum on a large scale, while at Mount Carmel aluminum works are already in operation. Given lightness and strength of material, the aid of gas and electricity, and ingenious mechanical appliances and inventions, there seems to be no good reason why the air may not be navigated with even greater ease and safety than the sea. The present project is not of hasty growth. The inventor says: "Public opinion has been so strong against such a thing that we worked on our plans and models for seven years without saying a word to any one. When we succeeded we organized this company, and obtained our capital before making the matter public." This is a statement calculated to give confidence, and certainly, whatever incredulity the public may express as to the practicability of the scheme proposed, there has never been a time in the history of the world when such an invention would be as readily and gladly received as now. A few hundred years ago the inventor would have stood an excellent chance to have been imprisoned or punished for his daring. Now honor, riches and fame await him who successfully solves the problem of aerial navigation. A glance at the possibilities of aerial travel from the Mount Carmel point of view will be interesting. A recent magazine writer described a pneumatic conveyance of the future by which the time of travel between New York and San Francisco is to be reduced to seven minutes. Owing to the difference of time between these cities, a man leaving the Pacific coast at 6 A. M. would in seven minutes reach New York about 10 A. M., and after transacting his day's business here would leave at 5 P. M. and reach home at 1 P. M. of the same day, in time to take a drive and visit his club before dinner. This Chicago scheme, however, promises nothing so rapid, though the *Herald* figures it out that if a speed of 200 miles an hour is obtained it will be possible for travelers to breakfast in Chicago, lunch in New York, and return to Chicago in the evening. Less than twenty-four hours will suffice for the trip from Chicago to London, and it will be possible to do the pyramids of Egypt and return inside a week. Jules Verne's fiction has been surpassed by fact, and the globe has been encircled in less than eighty days. In the new age of aluminum and aerial navigation a week will be amply sufficient. The great advantages in other respects will be innumerable. In addition to the advantages in business, social life will receive a new impulse. Opera and theatre-goers will look over the leading attractions of all the principal cities of the United States before deciding whether they will have Booth in New York, take in a Nikisch concert in Boston, hear Patti on her last farewell tour at Philadelphia, or gather roses and walk under magnolias at New Orleans. To stay at home when it is so easy to travel will be impossible, and ships innumerable will traverse "the desert and illimitable air" in every direction. And yet they call Chicago the Windy City!"

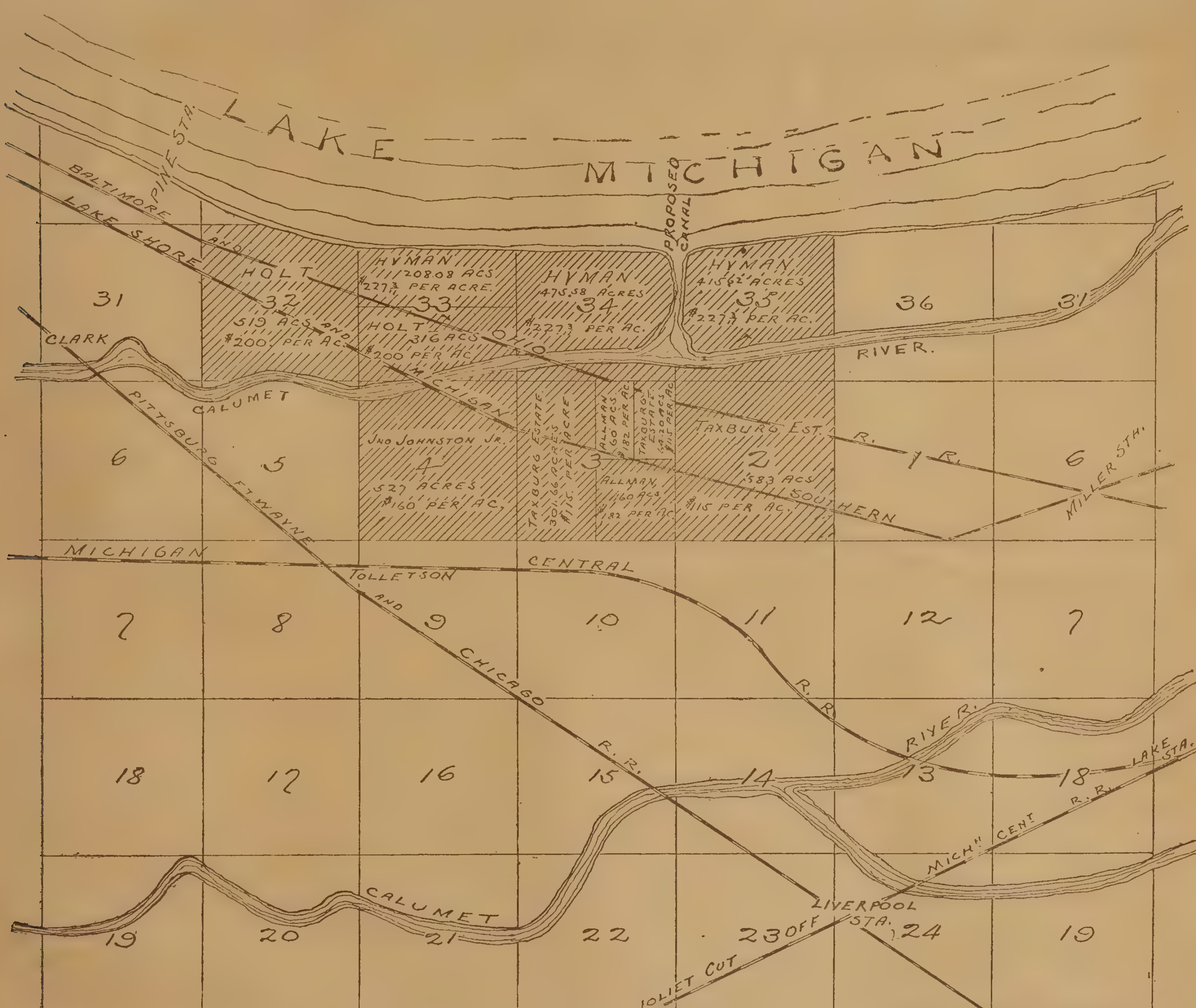
THE CHICAGO STOCK YARDS.

DESCRIPTION OF THE NEW SITE ACROSS THE INDIANA LINE.

The practical removing of the Union Stock Yards of Chicago from their present location at Forty-first Street to beyond the State Line in Indiana is of sufficient importance to the whole country to deserve at our hands a more full description than we have yet given. The AMERICAN ANALYST has already given an account of the purchase of a tract of land by trustees for the three largest packers of Chicago. In this issue we furnish our readers with a map giving a better idea of the area in which the property is situated, and another map devoted more specifically to the area purchased. Both of these maps are taken from the Government surveys made by Captain W. L. Marshall of the United States Engineer Corps, in 1888. These surveys were made with a view of estimating the probable cost and feasibility of dredging a channel through the north end of the Grand Calumet River into Lake Michigan, and thus forming a safe and convenient harbor there for lake vessels of all classes. It was found and reported that the scheme was a feasible one, and would cost about one million and a half of dollars. But the purchase of these lands for the purpose of establishing a new stock yard with all the plants of these immense packing establishments was consummated entirely independent of any expected Government work. The land just acquired is situated in Lake County, Ind., about twenty miles southeast of the Court-house in Chicago and eight miles from the State line between Illinois and Indiana, which here, also, is the city limit line. It is twelve miles north of Crown Point, lies on the Great Calumet River and Lake Michigan, about seven miles east of Hammond. The property has a frontage of four miles on Lake Michigan and eight miles on the Grand Calumet River. It is situated some distance northeast of Tolleston, northwest of Miller's Station, and east of Clark Station. It is amply supplied with water, and as the question of transportation enters largely into the desirability of the location, it may be said that in this respect it is very much more convenient than the present stock yards. On the land, or within easy reach of it, are the Baltimore & Ohio, the Lake Shore and Michigan Southern, the Michigan Central, the Fort Wayne, th Calumet Terminal, and the Elgin, Joliet & Southeastern Railroad, better known as the Outer Belt Line, a road controlled by Drexel, Morgan & Co., now running from Waukeegan to McCool, just southeast of this land. It was intended to have put the eastern terminal of this road at Michigan City, but under present arrangements made between the purchasers of this tract and the company the line will run to a harbor to be excavated on the lake front of this land, thus enabling the operators at these new stock yards to have vessels bring their ice, coal, salt and lumber right to their wharves, and also to load steamers at the wharf directly for Liverpool via the Welland Canal. The railroad facilities will obviate the delays incident to the crowded condition of all the present stock yards, which now amount to an average of ten hours' delay on every shipment in and out of the present stock yards. The tract consists of almost four thousand acres, and cost $750.000. It was conveyed by the different owners to Albert H. Veeder and Edward J. Martyn as trustees for G. F. Swift, P. D. Armour and Nelson Morris. It naturally occurs to the mind that to move an extensive plant such as has been operated by these three of the largest firms must be a serious and expensive undertaking, but, as will be shown, the amount of saving that can be made by this removal will more than pay for the entire expense of the lands and improvements in less than two years, without saying anything of innumerable advantages which we will also partially specify. For instance, these three concerns run more refrigerator cars than any but the largest trunk lines of railroads in the United States. Up to this time these cars were repaired in three different car shops, maintained by these several firms. In the new location these three car shops will be consolidated into one, thus saving probably one-half of the total expense now incurred by the three firms. Another item of saving will be in the utilizing of the offal incident to all slaughter houses. This offal has been worked up into fertilizers in three separate factories; on the new location it will be consolidated into one factory, thus making a large saving on what is at best only a cheap way of getting rid of waste material. The time saved in switching cars in and out of the yard at the new location averaging, as has already been stated, ten hours each way, will be a very large saving in ice, time, labor, interest on capital and mileage of cars, besides enabling the shippers to reach their market twenty-four hours quicker. All these savings cannot readily be estimated in dollars and cents, but a few items which can be so estimated will serve to more fully illustrate the advantage to the packers in making this move. The item of switching cars in and out of the yard now costs on an average $4 per car; it can be done at the new location for fifty cents a car. The three houses, judging from the number of cars moved now, will on this item save $1,575.00 a day, making in a year over $47,000. Water, which now costs each one of the houses over $2,000 a month, can be got on the new tract for $500 a month, making a saving of $54,000. Insurance, which, owing to the crowded condition of the present location, is very high, will make a saving of $50,000 a year. These houses bring large quantities of cattle and hogs from other points, such as Kansas City and Omaha, to the present yards, where it costs them $5 a car for the privilege of landing their cattle and hogs and driving them to their own yards, besides exorbitant prices charged by the present stock yard management for feeding. On this item of yardage and feed the saving will be $100,000 a year. We have thus shown in these four items an annual saving of nearly $700.000—which is almost equal to the cost of the land. Another item which strongly influenced this move is the fact that when the present stock yards were under the municipal

LOCATION OF THE NEW CHICAGO AND CALUMET STOCK YARDS.

government of the town of Lake, the people of that town knew their interest too well to permit of any very oppressive legislation against their best citizens, the packers. Since the town of Lake has been annexed to the city of Chicago many oppressive taxes and expensive burdens have been put upon the packers, until it has become almost unbearable. Two items alone—that of boiler inspection and electric light inspection—have cost one of the packers $500 each. The new yards, being located in the State of Indiana, are exempted from any unfriendly legislation by the State of Illinois, and are protected by the Federal laws and court decisions. The scarcity of water, which last summer compelled the packers to suspend operations for over a week, the refusal of the city authorities to increase the supply or allow the packers to increase the supply has seriously hampered operations at the present location. This will be entirely obviated in the new place. The improvement in the way of room can be understood better by the statement that the present stock yards and sites occupied by the packing houses are only a mile square, while the new ground covers about eight square miles. Another advantage, which at first might seem a disadvantage, is the question what the packers will do with their present buildings and plants. The buildings now occupied are old, and having been added to from time to time as the business increased, have become very inconvenient and disproportionately expensive for further use. The buildings can be sold for manufacturing purposes or warehouses. New ones can be built to better advantage, with improved machinery. The best of the old machinery can be transferred, and therefore the loss owing to removal will be limited. The new enterprise has been incorporated under the name of the Chicago and Calumet Stock Yards, and will be arranged with necessary office buildings, yards, scales, restaurant, bank, stables, pens, feeding arrangements, rendering factory, packing houses, slaughter houses, coolers, car shops and fertilizer factory, all with the latest improvements and for the greater convenience of those transacting business there. The Outer Belt Line mentioned connects with every railroad that enters Chicago. Topographical surveys are being now made with a view of laying out the stock yards and plant, and another desirable improvement, both for the yards as well as for the benefit of employer and employes, will be the model town to be established there, in which it is proposed to have the employes of the new stock yards own their own homes, inducing habits of economy, thrift and sobriety, and averting another great drawback to the present location—the tendency to labor strikes. When it is considered that these three establishments employ 15,000 hands, and we only allow a family of three to each one of these, it will make 45,000 inhabitants, and with 5,000 additional inhabitants, as storekeepers and suppliers of the manifold wants of a town, it will make a new city of 50,000 inhabitants. Inducements will be offer d to congenial manufacturing enterprises to locate on this tract and enjoy the benefits of the shipping facilities that will be had there. This, one of the largest real estate operations that has taken place in Chicago for many years, will have an important influence on the interests of Chicago. Becoming a great industrial centre, it will naturally largely enhance the value of surrounding lands, and quickly bring land up from an acreage value to a lot valuation. The most prominent of the tracts in this new location were conveyed by R. W. Hyman, Jr., the well-known real estate operator, who bought this land at the rate of about $29 per acre, and has now sold it at $227 per acre, having held it only about one year. Nor was this transaction a piece of luck. It was simply the remarkable foresight of Mr. Hyman, which has been shown not merely at that point but at many others where he has acquired lands that others would not look at. Undoubtedly all the land between Hammond and these lands will advance under this influence. The land just purchased lies ten to fifteen feet above the lake and the river, and the soil is sandy. There is a good growth of hard wood, and one of the peculiarities of the region are the hills, some of which are one hundred feet high, composed of fine, marketable sand. The Grand Calumet River in that vicinity is an average of about a quarter of a mile wide, and is navigable as far east as Clark Station. It is



PLAT OF THE NEW CHICAGO AND CALUMET STOCK YARDS.

classified as navigable by the Government. The water in the river along that stretch is about ten feet deep. To a point about half a mile east of Hammond the stream is 200 feet wide and 18 feet deep. A proposed canal will be seen on the map, connecting Lake Michigan with the river, and will be followed by the erection of piers, warehouses, and other paraphernalia of an industrial centre. Among the other physical advantages of the location is the supply of oil from the pipes of the Standard Oil Company and natural gas, which will be furnished by the concern which recently undertook to convey the gas to Chicago. The company's pipes are now laid as far as the low land just south of Tolleston, and it will unquestionably be easy to furnish the new stock yards with that form of fuel. Another important item is that of taxes, which on the land just mentioned will not exceed $600 per year. Of course, when the stock yards' plant has been established there the taxes will be considerably advanced; but they will look very small as compared with what the stock yards' lands are now obliged to pay. Furthermore, the packers will be exempted from all sumptuary laws with which the Chicago city government has so often vexed them. The magnitude of the business of the stock yards where now located can be seen from the figures for the year 1889. There were received 3,023,281 head of cattle, 5,998,526 hogs, 1,832,469 sheep, 122,968 calves, and 79,926 horses, representing a total valuation of $203,321,924, being $21,119,135 in excess of the valuation of the receipts for the previous year. The transaction by which the Chicago Junction Railways and Union Stock Yards Company acquired control of the present stock yards. site is fresh in the memory of every newspaper reader. The corporation is a very strong one, composed of some of the best men in this country and in England, and its capital stock is $13,000,000, while there is an issue of $10,000,000 of 5 per cent. bonds, making the entire value of the property $23 000,000, as expressed by its securities. Both the common and the preferred stock still remains in the hands of the underwriters, as the time proved to be inopportune for floating them among the people. The bonds are in the hands of investors. There has been little market for the preferred stock since it was issued, and none at all for the common. A sale of the preferred stock was made in Boston a few days since at 89, and 100 shares were sold in Chicago at 90. Under the present circumstances and the probable removal of the yards, the outlook for future dividends is not promising.

CORRESPONDENCE.

NARROW-MINDED MEDICAL "REGULARS."

NEW YORK, December 14, 1890.

Editors American Analyst: I do not desire to use any part of your valuable space (which I know to be always at the disposal of any one who has a "word in season" to say) to cavil or find fault, for the mere pleasure of being captious, but matters have reached such a state that I think a few words upon the subject of so-called "medical ethics" may not be ill-timed. When such a man as Roberts Bartholow is singled out for persecution, because, forsooth, he styles himself "Electro-Therapeutist," it is time for some one to protest. The narrow and contracted views of a certain clique of so-called conservative "regulars," in all our larger cities, are below animadversion, but when they attempt to use their standing and influence to injure brethren whose views may not accord with their own, especially concerning certain subjects, it is an outrage on our American love of fair play. I have in mind a few instances of this dog-in-the-manger policy. Let me cite one. A certain young graduate of a first-class medical college in Illinois, came to this city for the purpose of beginning practice. The new medical code had just gone into force, so he applied to the regents of the university for examination and endorsement of his diploma. He went before the board, and in all branches pertaining to his profession passed easily. Nevertheless, he was rejected, and the right to practice his profession in this State denied him. Why? Because he did not answer correctly a question in grammar, and one in mathematics! Is any comment necessary? The policy of the board appears to be, "keep out every man possible!" "Pass just as few as our powers permit." I am not in favor of admitting illiterate men into the ranks of the profession, but I know the gentleman referred to, as a more than usually well informed man on all subjects, and the questions which caused his failure would disfranchise 95 per cent. of all the physicians now in practice, were they compelled to answer them without warning. Again, the columns of the daily press, as well as the purely medical journals, are filled with accounts of the various trials of Koch's lymph! Has Koch given the ingredients and proportions of his bactericide to the profession? If I understand the matter aright he has *not* done so. Now, is it not an unbending law of ethics, that we shall use no remedial agent the constituent parts of which are kept a secret? Scarcely a day passes that I do not have to listen to a tirade against proprietory nostrums on the part of some fanatical conservative. Alas! It is too disheartening to be compelled to submit to such a "code of ethics," and the day is not far distant when the medical profession will throw off the yoke imposed by bigotry and selfishness. Must I, after giving my best years, my health, and the richest outcome of such intellect as God has given me, be forced to hand all that I may have been able to originate over to every feeble minded, lazy, incompetent or grasping fellow "physician," simply because it is contrary to ethics for me to profit by my discovery or invention, and to retain the secret which makes it of value? All this is so true that no reiteration or citation of facts could make it a whit the more palpable. "Verbum Sap!"

Respectfully,
ONE WHO DOES NOT DEAL
IN PROPRIETARY MEDICINES.

WOMEN'S WORK.

INDUSTRIES WHICH CIVILIZATION HAS TAKEN FROM WOMEN.

(*Laura C. Holloway, in Drake's Magazine, December.*)

A New York lawyer who had been in a fit of ill-humor over his inability to get a situation for a young man, and found on investigation that women were filling the cheaper places in stores, gave vent to his feelings in a street car, because reminded of the matter by the presence of so many working women. "Those women are all usurpers of men's work," he exclaimed. "They ought to stay at home and let the men earn a living. But, no; they are everywhere, in our offices ticking their type-writers, sending telegrams, keeping books, writing for newspapers, editing magazines and——" "What would you advise them to do for a livelihood?" I inquired. "Anything they want to do except to crowd men out of their rightful places." The car jostled along toward the statue of Franklin, in Printing House Square, and a forlorn-looking little girl stepped on with her arm full of papers. "Look at that!" spoke up my irritated friend. "Do you tell me that is work a girl ought to be doing?" "Do you think she does such work from choice?" I retorted. "A civilization that admits of such an outrage on childhood is nothing to boast of. I, for one, am ashamed to admit that we have still so much to learn." "But you women encourage this kind of thing; you are all pushing women and girls into every conceivable place where salaries are paid, and men are powerless because women will work for less than men can." Thinking over the unsatisfactory conversation at home, I concluded I would study up the question and look at it from the practical standpoint. First, I satisfied myself as to the charge that women were encroaching upon the industrial domain of men, and then I looked into the causes which had led to the condition of things deplored by my friend. The result of my investigation surprised me. The whole female sex have been deprived of the employments by which they once earned money, and they are simply compelled to crowd into the poorest paid places now claimed by men. A hundred years ago men would have scorned to do the baking and the brewing and the candle-making for communities. It was the work which women had done from time immemorial, and as it was hard work they were cheerfully allowed to have the sole right to it. In our grandmothers' day women were the butter and cheese makers of the world; they were the jam and pickle and candy makers, too, and the spinning and the weaving and dyeing were done by them. The men would have resented any prophecy that they would take all these industries from women, but they have. The butter and cheese making of this country, and of all countries, remained in women's hands until machinery was invented, and then the work became important enough for men to undertake it. What man would have used the spindle and the distaff? Now he cheerfully spins and weaves by machinery and calls himself a manufacturer. Women were once the stocking-knitters of the world, and the industry supported thousands; now knitting is a lost art, while machinery turns out the hosiery of civilized countries. It is civilization that has caused women to be helpless and dependent, and where the strain is greatest, to be desperate. What wonder is it that they clamor for the places held by men, when men have taken their employments away from them. How long ago has it been since women moulded all the candles used? How many decades since they were the exclusive lace makers and embroiderers? Now men are lace manufacturers, and women are robbed of their best means of livelihood. Women once did all the work of dry salters, of perfume making, of a dozen other callings now closed to them. A hundred years ago women were the only nurses and midwives in the world, and men have crowded them out of these peculiarly feminine employments, and which they have not filled as satisfactorily. Once women did all the trading in the markets, going early in the morning and bartering the family produce, which the men had cultivated and gathered. My lawyer friend had not understood all this, but he ought, being familiar with the old common law, which took cognizance in many instances of the trades followed by the sex. "Once upon a time," as the nursery rhyme begins, there was reason for calling women help-meets of their husbands. The home was the centre of industries which the women directed and controlled. What was made by her was hers and her children's, and she had the handling of money and bought and sold as she willed. The man's work was out-of-doors, at his trade, or on the farm. Men looked to women to spin the wool or cotton, to dye it and then cut and make it into clothing for them, and they respected them for their knowledge and industry. The food they ate they owed to the labor and ability of women, and in all things pertaining to their material comfort they depended upon their wives and daughters, and were reverent and grateful to them. The inventions of the age have dethroned women industrially, and the increase of population has forced many into idleness who would prefer the severest toil to the horrors of dependence. Even the trade of marriage, which has been her *dernier resort* for the past fifty years, is gradually restricting itself, because of the factors at work fatal to its future universality. There are so many more women than men that the former have less and less opportunity in the matrimonial market, and many men are so poorly equipped for the battle of life that they cannot support families. Women will work, and they will fight for work before they will starve, hence the condition of things deplored and deplorable. Women are just as

able to-day as ever before in the history of the world to labor, and they are clamoring for it. They are protesting that men are destroying themselves and injuring the race by doing the indoor work, which they do as clerks in all kinds of business; and women are rightfully protesting that they do not want to be supported in idleness and be shut up with no satisfying employment when their brains are active, their health good and their ambitions strong. In old times there were no such things as divorces among the common people; they are so general now that the courts of the land are busy with them constantly. The reason for this state of things is to be found in the enforced idleness of wommen. The majority of men are persuaded in their own minds that women have enough to do in their homes to keep them busy and happy, but they have not, and they are denied the privilege of earning money, which is as inspiring an occupation for women as for men. The sewing machine and modern conveniences in houses relieve women of much detailed work, and the narrow limits of city homes leave little latitude for personal liberty. So women take to the streets for amusement, and go to the most attractive places open to them—the stores. It has often been sarcastically observed that women do nothing but shop and visit, and the men who are the most apt to sneer at the sex in this respect are generally those who would not permit their wives or daughters to engage in any occupation, for the sake of satisfying employment, with wages. Women of the poorest class work at manual labor, and fare better than those of the better orders, who must not do anything that will give them pecuniary returns. The shame of modern society has reached its height in the custom which compels a competent, intelligent woman to sit idly down to endure existence on a meagre income, earned by a husband who is perhaps physically and mentally unequal to the task. Some writer recently made the prediction that the women who are engaging in business enterprises, and who are very successfully pursuing professions, would ignore marriage almost universally hereafter. He gave reasons which may have satisfied him, but women know better than men why they prefer to avoid marriage if they are making comfortable supports. They do not want to go back to a state of idleness after having tasted of the pleasures and honors of a business or artistic career. It is not that they scorn marriage, but that they have progressed beyond the men who offer it. I heard a clever woman give as her reason for declining matrimony, that she could not live a dependent life again, and that city wives had to be dependent because there was nothing for them to do in flats, even in the way of housekeeping. She was willing to go on a farm and engage in agriculture, for she could endure privations if she had plenty of remunerative work which ultimately would reward her. The man, more helpless than herself, feared to give up his salaried position, and the woman refused his offer of marriage. Another generation will find women yet more brave in this direction than they are now. All intelligent women are ashamed of the custom which compels them to rear their daughters in idleness and exhibit them in the matrimonial market until they are disposed of, satisfactorily or otherwise. The transition state we are in is trying beyond compare to women, and men are too often hasty and unjust in their condemnation of women who are seeking footholds in the industrial world. Those who know the history of the sex realize that there has been gross injustice done women, and that they are more to blame for it than any one else. It is always harder to retrieve a lost position than to fight in it, but the dire necessity of women makes them strong, and twenty years hence we will note a vast improvement in their condition. Before the coming century reaches us, women will have retaken some of the lost ground; physically, they are rapidly improving and gaining the strength they had as workers. The woman question settles itself as soon as pecuniary independence is regained, for with it is allied bodily health, mental vigor and moral stamina. All that the sex ask is to be reinvested with their former privileges and to be enthroned as the head of the home, as an equal worker and partaker of the blessings that come to those who are its creators and supports.

DOMESTIC DIETETICS.

SPECIALLY PREPARED, FROM PRACTICAL TESTS, FOR THE LADY READERS OF THE "AMERICAN ANALYST."

SEASONABLE FOOD.

December.

MEATS.—Beef, mutton, pork, venison, veal.

POULTRY AND GAME.—Chickens, fowls, ducks, geese, turkeys, grouse, capons, hare, partridge, pheasants, rabbit, pea-fowl, guinea-fowl, snipe, widgeon, wild duck, woodcock.

FISH.—Brill, carp, cod, crabs, perch, salmon, smelts, soles, sprats, tench, turbot, whiting, halibut, sturgeon, oysters.

PRACTICAL RECIPES.

MEAT BALLS, WITH WALNUT SAUCE.—Chop fine together half a pound of meat, an onion, parsley, allspice, and thyme; add a small quantity of bread-crumbs, two well-beaten eggs, and a little flour to bind them. Make this into balls and fry. Cut in halves four or five English pickled walnuts; place them in a pan on the fire in diluted vinegar; when this is boiling put in the balls, already fried, and then let them simmer for about a quarter of an hour or a little less. Serve hot, with hard boiled eggs, cut up, placed around the dish, and parsely to garnish.

BAKED HASHED VEGETABLES.—Take equal quantities of rich vegetables, as carrots, potatoes, beets, cabbages, turnips, etc., which have been parboiled, chop them up and season them highly with pepper and salt, a dash of grated nutmeg, mace, and a little minced lemon peel. Mix all thoroughly, and put it into a buttered pie-dish. Cover with one well-beaten egg, or with finely grated bread crumbs, and put it into the oven to bake.

FRENCH PIE.—Chop very fine any left over cold meat, season it highly, moisten it well with gravy, and beat thoroughly; put it in a deep pie-plate, heap mashed potatoes over it, put little bits of butter over the top, and brown in the oven.

CHEESE TOAST.—Toast very brown and crisp some thin slices of bread; grate and slice some cheese and put it in the oven in a buttered baking-dish; watch carefully and when it begins to dissolve, stir some butter and a dash of cayenne pepper into it; pour it on the toast and serve at once.

GELATINE CREAM.—Soak three tablespoonfuls of gelatine in two cupfuls of milk; when it is soft, put it on the stove, and when it comes to the boil add three tablespoonfuls of sugar, and three well-beaten egg-yolks. Take from the fire, beat for a few minutes, and then add the egg-whites, well beaten and a pinch of salt; flavor with vanilla; pour into wet moulds and set away to harden; serve with custard or cream.

WHITE GINGERBREAD.—Half a pound butter, half a pound sugar, one pound flour, grated rind of a fresh lemon, one ounce ground ginger, a grated nutmeg, half cupful sweet milk and a small half-teaspoonful of soda; mix together the sugar, flour, lemon, spices, and rub the butter into them; warm the milk, dissolve the soda in it, add it to the rest of the ingredients, roll out, cut into square cakes and bake.

APPLE PANCAKES.—One quart milk, three eggs, a little salt, flour, one dozen large apples; make a batter of the milk, eggs, flour and salt; pare, core and chop the apples, add them to the batter, fry in butter, and eat with powdered sugar. If they are not light enough, add one teaspoonful baking powder.

FRUIT BREAD PUDDING.—Make a bread pudding; bake it in a stone dish about half full; when nearly done draw it to the oven door, put a layer of fruit over it and put it back again to bake. When done make a meringue of the whites of three eggs and a little sugar, brown slightly and serve.

LEEK AND POTATO SOUP.—Fry a bunch of leeks in butter until brown; season them with pepper and salt, and pour over them three pints of boiling water; let them simmer for half an hour; add four fine large raw potatoes cut into slices, and boil until the potatoes are soft. Press through a sieve, heat up again, add one pint of boiling cream or one pint of boiling milk, and a lump of butter, and serve.

CHRISTMAS CAKES.—Beat till very light one pound of powdered sugar with four eggs; then add one pound of sifted flour. Roll out on a pie-board, sprinkle with aniseed, cut into fancy shapes, and bake in a medium hot oven.

A PIE FOUNDRY.

HOW THE TOOTHSOME PIE IS MANUFACTURED FOR THE WHOLESALE TRADE.

A visit to one of the great New York pie foundries is well worth while, and it is a revelation to those who have only seen pies made one at a time, in the old-fashioned way. Entering the large wagon-door on the ground floor one first sees the long rows of delivery wagons receiving their precious loads. Men in white aprons and caps scurry about with trays of pie, and near some of the wagons trays are piled as high as a man's head. Each wagon will hold 600 pies neatly packed in shallow shelves at the sides. Little doors close over each tier of pie, and the pastry is transplanted without the slightest danger of being crushed. In another part of the ground floor, pumpkins, squashes, apples, peaches and cranberries are being unloaded and stored. Only a small quantity of these perishable fruits is kept in stock and the supply has to be constantly renewed. In the basement are the great brick ovens, the mince, custard and cocoanut departments, and the large rooms devoted to the manufacture of crust. Everything about the basement is spotlessly clean, and the bakers are dressed in the white uniforms of their profession. The pies are all hand-made, but the rapidity with which a single one is made ready for the oven is startling. There are long benches upon which eighteen or twenty bakers knead great lumps of dough, while others roll it out in great sheets. Piles of pie-tins, six, nine and thirteen inches in diameter, stand about, and as each square wooden tray for the reception of finished pie is filled it is marched off to the oven-room. The department for the manufacture of the fruit interiors is upstairs, and the great wooden dishes containing pie contents are brought down to the crust-room on elevators. In the bake-room, which is entirely of brick, there are from ten to twenty brick ovens, according to the size of the establishment. These ovens are, to all intents and purposes, like the old-fashioned brick ovens, and their usual size is nine by twelve feet. At one corner of each oven is a grate upon which live coals glow and give forth the heat that gives the pie its proper browning. By an ingenious arrangement of drafts an even temperature is maintained throughout, and the burning of a pie is an unheard of calamity. The pies are put in and taken out of the ovens by means of long-handled wooden spades, technically called "peels." As the pies come out, done to a beautiful brown, they are placed in one of the square wooden trays and taken to the ground floor, where they are packed in the delivery wagons. Three sizes of pie are constructed, six, nine and thirteen inches in diameter, and the average thickness is three-quarters of an inch. The average weight of a nine-inch pie is eighteen ounces, but this varies greatly, according to the variety. The kinds now most in demand are apple, mince, peach, plum, lemon, cranberry, pumpkin, cus-

tard and cocoanut. Cocoanut, pumpkin and custard pies are not made in summer, because of the difficulty of keeping them. One-third of all the pie made is apple. Pumpkin and mince are just now the next most popular. It is this year difficult to get good apples, and without doubt the demand for apple pie will steadily decrease. The demand for plum pie is smallest. When the wagons are all loaded they are rapidly driven to the restaurants, hotels and bakeries, and shortly afterwards the business man is munching a piece and telling his friend how much better pie his mother used to make.

FIFTY DOLLARS FOR TEN CENTS.

WHAT AN EXCHANGE SAYS REGARDING CARBOLIC SMOKE BALLS.

One of the latest introductions for the purpose of banishing catarrh, neuralgia, headache, deafness, hay fever, asthma, croup, whooping cough; also cures (?) granulated eyelids and sore eyes. Directions: Hold the ball about one-eight inch below the silk floss, with the thumb and forefinger of the left hand, about one and one-half inches below the nose and directly in front of the mouth. Snap rapidly on side of the ball, but only on the place softened and marked, during each inhalation, with the middle finger of right hand, which will cause the smoke to arise. As found, it consists of a small round ball, wrapped in red cloth, with the ends hanging slightly loose. Upon opening it was found to contain 310 grains of gray powder, which upon snuffing up the nose caused a violent sneezing, and there is an odor of smoke due to a tarry body. Upon an examination made in our laboratory by A. W. Snow, it was found to consist of glycyrrhiza and flour (identified by microscopical examination and physical properties), and one of the veratrums, probably white hellebore (identified by means of the alkaloid jervine, which was separated and identified). The smoky body is some tar product, not easy to say just which. It is this latter, and the white hellebore which it contains, that cause it to yield a temporary relief; permanent relief we do do not believe it can afford. No quantitative estimates were attempted. This cure costs the consumer $2.50 per ball. Money could be made on the material at ten cents per pound, enough for nineteen balls with a little to waste; or prepared in the form of a ball, as it is sold, it would yield a handsome profit at five cents a ball.—*New Idea.*

BUSINESS NOTES.

FINE PRESERVES.

Twenty-five years ago the only preserves in the market were coarse, old-fashioned goods, which, however wholesome, were not over-palatable and certainly not too appetizing in appearance. At that time the demand for sweetmeats increased, and as a result two tendencies became immediately visible. The one was towards cheapness rather than quality, and culminated in the production of jellies which were composed of vegetable gelatine, chemical flavors and artificial dyes, and of preserves made from the poorest fruits and the commonest glucose. These are turned out to-day in vast quantities and are found in nearly every store of the land. While most are pleasant to the taste, none are nutritious, and a large number are very deleterious, some indeed being dangerous to health and even life. The other tendency was towards quality rather than cheapness, and culminated in the production of the finest preserves known to the world. Pure fruit jellies, in which all the fragrance and flavor of the original are contained; jams and marmalades, that are both charming to the eye, nostril and tongue, and beneficient to the stomach; preserved fruits that are even more delicious than those in their natural state, are the final outcome with which the United States has carried off medals and honorable mentions in every great exposition. In this movement the chief credit is due to Gordon & Dilworth, New York City. They started this line of business, and to-day justly retain the pre-eminence they earned long ago. Their goods still remain the best not only in this country, but also in the world.

FOR OPIUM HABIT

use Horsford's Acid Phosphate. Dr. Wm. Powell, New York Mills, N. Y., says: "Its free use in breaking off the opium habit has prevented that intense nervous prostration which always follows when the narcotic is withdrawn." For Abuse of Alcohol: It relieves the depression therefrom.

A VALUABLE HANDBOOK.

A useful weekly publication, costing only fifty cents a year, is *Knowledge*, a unique little magazine which ought to have great popularity among all owners of Cyclopedias. It undertakes to supply the information which one ordinarily seeks in his Cyclopedia and *fails to find* there, because it is not "up to date"—it was published "last year," or, more probably, several years ago. "The world moves," and the most important questions that want answering are questions of *to-day*, not of yesterday; *Knowledge* answers, during the year several thousand such questions. JOHN B. ALDEN, 393 Pearl Street, New York.

OLIVE CANDY.—It is reported that a new candy is manufactured at Natchez, Miss., by a young lady, who has discovered the art of making the article from the flowers of the sweet olive-tree. She is also said to make a beautifully clear table syrup of the same plant.

QUEER TRICK.—The latest variation of the conjurers' box trick, performed by Mr. Hertz in London, manacles a man and padlocks him to a board, and then suspends him in midair. Curtains are then drawn around him, but not reaching within several feet of the ground. In a few seconds a woman is found in the place of the man, and the man himself is in the audience.

RETALIATION.—One day Hahnemann, the patron saint of homœopathy, received a visit from a sick English lord. Without examining the patient, or hearing any explanation, Hahnemann pulled out a small vial and passed it under the astonished Englishman's nose. "Inhale that," said he, "and you will be cured." The Englishman rose and said stiffly: "How much do I owe you, sir?" and Hahnemann responded: "One thousand francs, sir." The Briton calmly drew a note from his purse, and, passing it under his nose, said: "There, inhale that. Now you are paid!" and walked out in unruffled dignity, leaving the great imposter to his own meditations.

RAW MATERIAL.—The Treasury Department has received a letter from the Customs Collector at Detroit, asking information as to the proper classification of frogs (not alive). The department replies that the question has never been decided by it, but in a letter to a gentleman in Rochester it was suggested that such frogs were dutiable at 35 per cent. ad valorem as "prepared meats," but this suggestion, it says, appears to be untenable, as it is understood that the frogs are not prepared in any manner, but are merely dead frogs. The department is of opinion that they are unprovided for in the act of March 3, 1833, and should have been classified as raw, unmanufactured articles, under section 2,513, at 10 per cent. ad valorem.